EXHIBIT 2-A

(Final Environmental Assessment available at: https://new.mta.info/document/110751)

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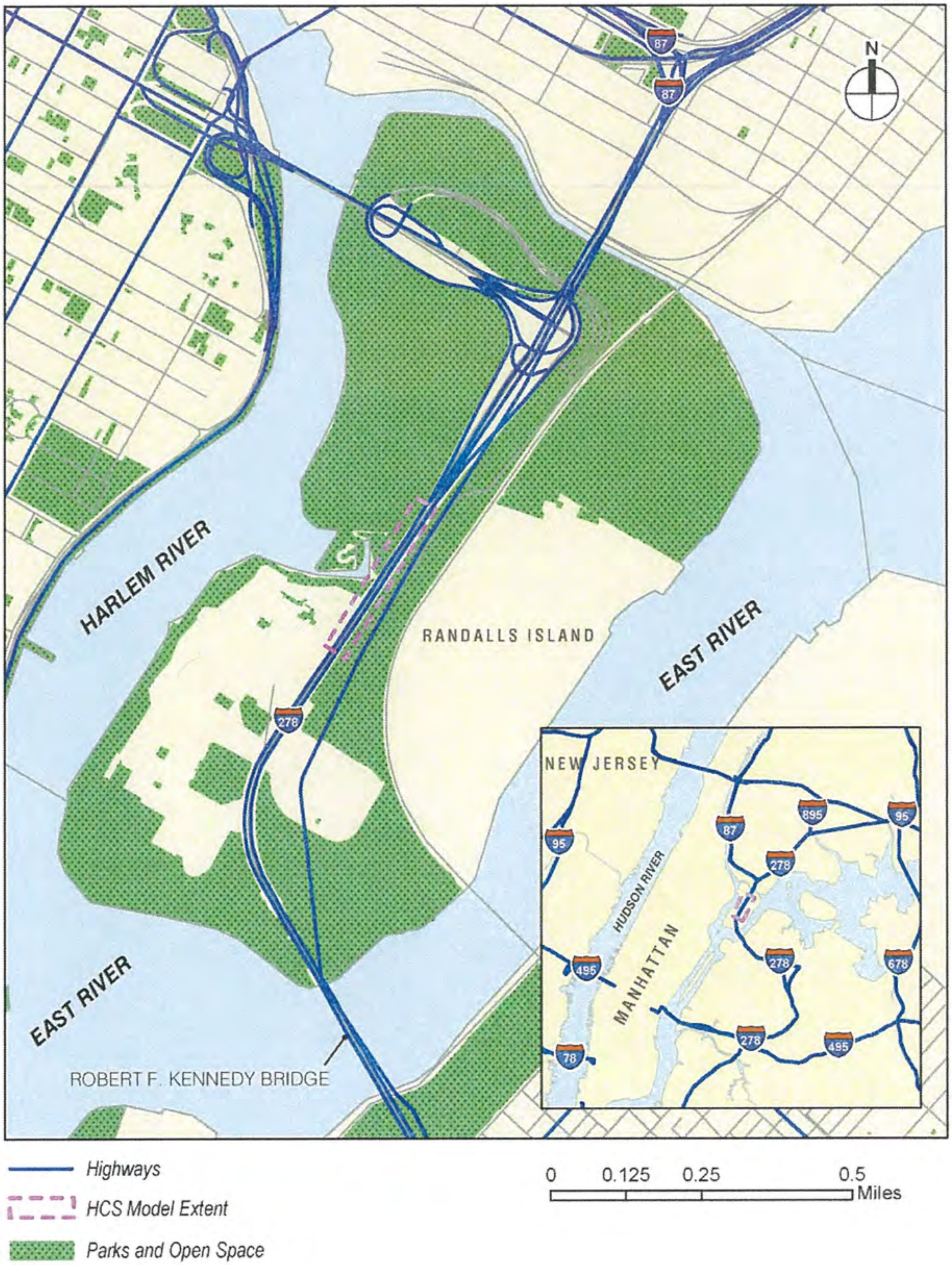
Figure 4B-11. Highways Leading to the Robert F. Kennedy Bridge



Source: WSP, 2022.

AM Results

With CBD tolling, traffic in the northbound direction is projected to increase by approximately 508 vehicles heading into Manhattan or Bronx. This would result in the northbound density along I-278 to increase by approximately 3.6 pc/mi/ln. There would be potential change in LOS from D to marginally E under the tolling scenarios with the largest increases in traffic volumes. However, the speeds would remain about the same at approximately 40 mph and increases in delays would be below the 2.5-minute threshold; therefore, there would not be an adverse traffic effect during the AM in the northbound direction. Traffic in the southbound direction is projected to increase by approximately 396 vehicles heading into Queens. This would result in the southbound density along I-278 to increase by approximately 2.7 pc/mi/ln. There would be a potential change in LOS from D to marginally E under the tolling scenarios with the largest increases in traffic volumes. However, the speeds would remain about the same at approximately 40 mph and increases in delays would be below the 2.5-minute threshold; therefore, there would not be an adverse traffic effect during the AM in the southbound direction.

Table 4B-23 summarizes the changes in traffic volumes, density, and LOS between existing conditions, the No Action Alternative, and the CBD Tolling Alternative (Tolling Scenario D) for the Bayonne Bridge, RFK Bridge, and I-95 Eastern Spur for the AM time period.

MD Results

With CBD tolling, traffic in the northbound direction is projected to increase by approximately 261 vehicles heading into Manhattan or Bronx. This would result in the northbound density along I-278 to increase by approximately 2.4 pc/mi/ln and the LOS would remain LOS D. Speeds would remain about the same at 40 mph and the increase in delay would be small and well below the 2.5-minute threshold.

Traffic in the southbound direction is projected to increase by approximately 474 vehicles heading into Queens. This would result in the southbound density along I-278 to increase by approximately 3.3 pc/mi/ln. and the LOS service would decrease from LOS C to D. Speeds would remain about the same at 40 mph or higher and the increase in delay would be small and well below the 2.5-minute threshold.

Table 4B-24 summarizes the changes in traffic volumes, density, and LOS between existing conditions, the No Action Alternative, and the CBD Tolling Alternative (Tolling Scenario D) for the Bayonne Bridge, RFK Bridge, and I-95 Eastern Spur for the MD time period.

Table 4B-23. Highway Capacity Software Performance Measures (AM)

DIRECTION	LOCATION	HOURLY VOLUME			
		EXISTING CONDITION	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume					
Northbound	Bayonne Bridge	1,075	1,091	1,467	376
	RFK Bridge	4,452	4,575	5,083	508
	Eastern Spur I-95 (Pre-ramp)	152	152	208	56
	Merge from 495	641	660	657	-3
	Eastern Spur I-95 (Post-ramp)	793	811	865	53
Southbound	Bayonne Bridge	659	678	759	81
	RFK Bridge	4,951	5,127	5,524	396
	Eastern Spur I-95 (Pre-ramp)	1,063	1,145	1,244	98
	Diverge to 495	630	627	686	59
	Eastern Spur I-95 (Post-ramp)	433	519	558	39
Density (pc/mi/ln)					
Northbound	Bayonne Bridge	15.4	15.6	20.5	4.9
	RFK Bridge	31.1	32	35.6	3.6
	Eastern Spur I-95 (Pre-ramp)	1.4	1.4	1.8	0.4
	Merge from 495	8.2	8.4	8.6	0.2
	Eastern Spur I-95 (Post-ramp)	6.5	6.7	7.1	0.4
Southbound	Bayonne Bridge	10.5	10.8	11.8	1
	RFK Bridge	34.4	35.6	38.3	2.7
	Eastern Spur I-95 (Pre-ramp)	8.6	9.3	9.9	0.6
	Diverge to 495	4.9	5.2	5.6	0.4
	Eastern Spur I-95 (Post-ramp)	3.4	4.1	4.3	0.2
Level of Service (LOS)					
Northbound	Bayonne Bridge	B	B	C	—
	RFK Bridge	D	D	E	
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Merge from 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—
Southbound	Bayonne Bridge	A	A	B	—
	RFK Bridge	D	E	E	
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Diverge to 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—

Source: WSP, 2022.

Table 4B-24. Highway Capacity Software Performance Measures (MD)

DIRECTION	LOCATION	HOURLY VOLUME EXISTING CONDITION	HOURLY VOLUME NO ACTION ALTERNATIVE	HOURLY VOLUME CBD TOLLING ALTERNATIVE (Tolling Scenario D)	HOURLY VOLUME INCREMENTAL CHANGE
Hourly Volume					
Northbound	Bayonne Bridge	459	434	751	317
	RFK Bridge	4,325	4,381	4,642	261
	Eastern Spur I-95 (Pre-ramp)	225	195	237	42
	Merge from 495	572	569	590	21
	Eastern Spur I-95 (Post-ramp)	798	764	827	63
Southbound	Bayonne Bridge	592	585	683	97
	RFK Bridge	3,430	3,551	4,025	474
	Eastern Spur I-95 (Pre-ramp)	637	629	847	218
	Diverge to 495	596	586	646	60
	Eastern Spur I-95 (Post-ramp)	40	43	201	158
Density (pc/mi/ln)					
Northbound	Bayonne Bridge	7.4	7	11.3	4.3
	RFK Bridge	30.4	30.8	33.2	2.4
	Eastern Spur I-95 (Pre-ramp)	1.9	1.7	2	0.3
	Merge from 495	8.3	8.1	8.3	0.2
	Eastern Spur I-95 (Post-ramp)	6.8	6.5	6.9	0.4
Southbound	Bayonne Bridge	9.8	9.6	10.9	1.3
	RFK Bridge	24.7	25.6	28.9	3.3
	Eastern Spur I-95 (Pre-ramp)	5.4	5.3	7.0	1.7
	Diverge to 495	3	3	3.9	0.9
	Eastern Spur I-95 (Post-ramp)	0.4	0.4	1.5	1.1
Level of Service (LOS)					
Northbound	Bayonne Bridge	A	A	B	—
	RFK Bridge	D	D	D	—
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Merge from 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—
Southbound	Bayonne Bridge	A	A	A	—
	RFK Bridge	C	C	D	—
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Diverge to 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—

Source: WSP, 2022.

PM Results

With CBD tolling, traffic in the northbound direction is projected to increase by approximately 634 vehicles heading into Manhattan or Bronx. This would result in the northbound density along I-278 to increase by approximately 4.5 pc/mi/ln. There would be potential change in LOS from D to E under the analyzed tolling scenario with the highest increase in traffic. However, the speeds would remain about the same at approximately 40 mph or higher and the increase in delay would be small and well below the 2.5-minute threshold.

Traffic in the southbound direction is projected to increase by approximately 612 vehicles heading into Queens. This would result in the southbound density along I-278 to increase by approximately 4.1 pc/mi/ln and the LOS service would remain LOS D. However, the speeds would remain about the same at approximately 40 mph or higher and the increase in delay would be small and well below the 2.5-minute threshold.

Table 4B-25 summarizes the changes in traffic volumes, density, and LOS between existing conditions, the No Action Alternative, and the CBD Tolling Alternative (Tolling Scenario D) for the Bayonne Bridge, RFK Bridge, and I-95 Eastern Spur for the PM time period

LN Results

With CBD tolling, traffic in the northbound direction is projected to increase by approximately 93 vehicles heading into Manhattan or Bronx. This would result in the northbound density along I-278 to increase by approximately 0.9 pc/mi/ln and the LOS would remain LOS A. Traffic in the southbound direction is projected to increase by approximately 598 vehicles heading into Queens. This would result in the southbound density along I-278 to increase by approximately 3.7 pc/mi/ln and the LOS service would remain at acceptable LOS A. Therefore, there would not be an adverse traffic effect during the LN.

Table 4B-26 summarizes the changes in traffic volumes, density, and LOS between existing conditions, the No Action Alternative, and the CBD Tolling Alternative (Tolling Scenario D) for the Bayonne Bridge, RFK Bridge, and I-95 Eastern Spur for the LN time period.

Table 4B-25. Highway Capacity Software Performance Measures (PM)

DIRECTION	LOCATION	HOURLY VOLUM			
		EXISTING CONDITION	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume					
Northbound	Bayonne Bridge	563	570	783	213
	RFK Bridge	4,710	4,704	5,337	634
	Eastern Spur I-95 (Pre-ramp)	418	436	470	34
	Merge from 495	805	805	851	46
	Eastern Spur I-95 (Post-ramp)	1,223	1,241	1,321	80
Southbound	Bayonne Bridge	791	814	962	148
	RFK Bridge	4,159	4,344	4,957	612
	Eastern Spur I-95 (Pre-ramp)	801	792	847	56
	Diverge to 495	761	755	808	53
	Eastern Spur I-95 (Post-ramp)	40	37	39	3
Density (pc/mi/ln)					
Northbound	Bayonne Bridge	7.8	7.9	10.7	2.8
	RFK Bridge	31.3	31.2	35.7	4.5
	Eastern Spur I-95 (Pre-ramp)	3.1	3.2	3.5	0.3
	Merge from 495	10.4	10.5	10.9	0.4
	Eastern Spur I-95 (Post-ramp)	9.1	9.2	9.7	0.5
Southbound	Bayonne Bridge	11.2	11.6	13.4	1.8
	RFK Bridge	27.9	29.1	33.2	4.1
	Eastern Spur I-95 (Pre-ramp)	5.9	5.9	6.3	0.4
	Diverge to 495	3.4	3.3	3.6	0.3
	Eastern Spur I-95 (Post-ramp)	0.3	0.3	0.3	0
Level of Service (LOS)					
Northbound	Bayonne Bridge	A	A	A	—
	RFK Bridge	D	D	E	
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Merge from 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—
Southbound	Bayonne Bridge	B	B	B	—
	RFK Bridge	D	D	D	—
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Diverge to 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—

Source: WSP, 2022.

Table 4B-26. Highway Capacity Software Performance Measures (Late Night)

DIRECTION	LOCATION	HOURLY VOLUM			
		EXISTING CONDITION	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume					
Northbound	Bayonne Bridge	173	175	228	54
	RFK Bridge	847	866	959	93
	Eastern Spur I-95 (Pre-ramp)	15	16	15	-1
	Merge from 495	341	343	329	-14
	Eastern Spur I-95 (Post-ramp)	356	360	344	-16
Southbound	Bayonne Bridge	207	207	208	1
	RFK Bridge	833	847	1,446	598
	Eastern Spur I-95 (Pre-ramp)	347	354	458	104
	Diverge to 495	334	340	445	105
	Eastern Spur I-95 (Post-ramp)	13	14	13	-1
Density (pc/mi/ln)					
Northbound	Bayonne Bridge	2.6	2.6	3.3	0.7
	RFK Bridge	6.1	6.1	7	0.9
	Eastern Spur I-95 (Pre-ramp)	0.1	0.2	0.1	-0.1
	Merge from 495	4.5	4.5	4.3	-0.2
	Eastern Spur I-95 (Post-ramp)	2.8	2.8	2.6	-0.2
Southbound	Bayonne Bridge	3.3	3.3	3.3	0
	RFK Bridge	5.9	6.3	10.0	3.7
	Eastern Spur I-95 (Pre-ramp)	2.7	2.7	3.5	0.8
	Diverge to 495	1.5	1.5	2	0.5
	Eastern Spur I-95 (Post-ramp)	0.1	0.1	0.1	0
Level of Service (LOS)					
Northbound	Bayonne Bridge	A	A	A	—
	RFK Bridge	A	A	A	—
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Merge from 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—
Southbound	Bayonne	A	A	A	—
	RFK	A	A	A	—
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Diverge to 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—

Source: WSP, 2022.

SUMMARY OF HIGHWAY ASSESSMENT

Tolling Scenarios A, B, C, and G with the lowest level of discounts, exemptions, and/or crossing credits reduced overall traffic entering and leaving the Manhattan CBD with the least potential effect on travel patterns and diversions. However, VMT would increase slightly in Staten Island and the Bronx due to drivers to and from New Jersey diverting around the Manhattan CBD to avoid paying the CBD toll. Tolling Scenarios D, E, and F, with higher discounts, exemptions and/or crossing credits were found to create the highest overall reduction in traffic entering and leaving the Manhattan CBD, but with higher potential changes in travel patterns and diversions to several highways.

Tolling Scenario D, with higher Manhattan CBD crossing credits and no exemptions and discounts, was determined to have the highest potential for changes in travel patterns and a shift of traffic; therefore, Tolling Scenario D was selected for detailed analysis of potential traffic effects along highway approaches to the Manhattan CBD, along circumferential routes, and at local intersections adjacent to the tunnel portals and bridges crossing into the Manhattan CBD. Potential changes in travel patterns, diversions, and increases in traffic volumes at the affected facilities would fall into a narrow range; therefore, the potential traffic effects are expected to be similar for Tolling Scenarios D, E, and F.

The following four tunnels that cross into the Manhattan CBD have a potential for net increases in traffic due to diversion of traffic:[23]

- The potential shift in traffic to the Lincoln Tunnel for Tolling Scenario D would be offset by a reduction in traffic due to CBD tolling, resulting in a net reduction in traffic. Therefore, the Lincoln Tunnel and NJ Route 495 are expected to have generally reduced traffic and improved traffic operations for all tolling scenarios during the peak hours. Therefore, this facility was not analyzed further because there would not be an adverse effect for any tolling scenario.
- The potential shift in traffic to the Holland Tunnel for Scenario D would be offset by a reduction in traffic due to CBD tolling, resulting in a net reduction in traffic. Therefore, the Holland Tunnel, I-78, and NJ Route 139 are expected to have reduced traffic based on the BPM forecast and improved traffic operations for all tolling scenarios during the peak hours. Therefore, this facility was not analyzed further because there would not be an adverse effect for any tolling scenario.
- The Hugh L. Carey Tunnel is expected to have a net increase in traffic under the tolling scenarios with the largest increases in traffic volumes. A major portion of the increase in traffic in the tunnel is attributable to traffic diverted from the BQE, but overall traffic along the Gowanus Expressway/Prospect Expressway weaving segment leading to the Hugh L. Carey Tunnel and BQE should not increase appreciably. Under Tolling Scenario D, traffic volumes to the Hugh L. Carey Tunnel would increase by 72/486/47 vehicles during the AM, MD, and PM peak hours, respectively. Under the SEQRA criteria, based on a 5 percent increase in traffic under congested conditions and less than a 2.5-minute increase in delay, there would be no adverse effect during the AM and PM peak hours. During the MD peak hour, although the 5 percent increase in traffic would be exceeded, the increase

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23 Only the inbound direction was examined because that is the critical direction due to higher congestion and greater sensitivity to increases (or decreases) in traffic volumes.

in delay would be well below the 2.5-minute threshold and, therefore, there would not be an adverse effect. The Vissim analysis indicates that there would be minimal traffic effects because there would be sufficient reserve capacity in the two inbound lanes of the tunnel to handle the additional traffic volumes during the MD peak hour.

- The Queens-Midtown Tunnel and the Long Island Expressway (I-495) approaches are expected to have a net increase in traffic under the analyzed tolling scenario with the highest increase in traffic associated with crossing credits and a reduction in traffic under all other tolling scenarios. A major portion of the increase in traffic at the Queens-Midtown Tunnel is due to expected diversion of traffic from the Ed Koch Queensboro Bridge, which would be expected to have a net decline in traffic. Under Tolling Scenario D, traffic volumes at the Queens-Midtown Tunnel would increase by 125/383/203 vehicles during the AM, MD, and PM peak hours, respectively, resulting in increased queue lengths and delays for all peak hours. Under the SEQRA criteria, assuming a ***[greater than]*** 5 percent increase ***[in volume]*** under congested conditions and a delay of 2.5 minutes ***[or more]***, there would be a potential adverse effect in the MD peak hour but no anticipated adverse effect during the AM and PM peak hours. Representative of reduced exemptions and crossing credits, Tolling Scenarios A, B, C, and G would provide opportunities for reducing or avoiding potential adverse traffic effects.

All tolling scenarios would increase traffic along two circumferential routes—the Trans-Manhattan/Cross Bronx Expressway via the George Washington Bridge and the Staten Island Expressway (I-278) via the Verrazzano-Narrows Bridge—which would avoid the CBD tolls. In the inbound/eastbound direction, Tolling Scenarios A, B, C, and G would produce the highest diversions while in the outbound/westbound direction, Tolling Scenarios D, E, and F would produce the highest diversions. Overall, the potential diversion of traffic in the westbound direction would be expected to be higher than in the eastbound direction. The circumferential diversion of traffic is expected to have a potential effect on traffic operations along the Trans-Manhattan/Cross Bronx Expressway and, to a much lesser extent, along the Staten Island Expressway (I-278).

- **Staten Island Expressway (I-278):** Under Tolling Scenario D, there would be an increase in traffic volumes westbound on the Verrazzano-Narrows Bridge during the AM, MD, and PM peak hours of 32/201/75 vehicles on the lower level and 64/256/97 vehicles on the upper level, respectively. These increases in traffic are relatively small and would not have an appreciable effect on travel time, delays, speeds, and densities given the available capacity on the Verrazzano-Narrows Bridge. The LOS would remain the same during all time periods for all highway segments operating at LOS B/C during the AM and MD peak hours and LOS E/F during the PM peak hour; therefore, Tolling Scenario D (and Tolling Scenarios E and F), would have no adverse traffic effect along the Verrazzano-Narrows Bridge and the Staten Island Expressway (I-278) during any time period under the SEQRA criteria. Tolling Scenarios A, B, C, and G, with Lower Manhattan CBD tolls, would be expected to create fewer diversions than Tolling Scenarios D, E, and F; therefore, these tolling scenarios would also not result in adverse traffic effects.
- **George Washington Bridge:** Under Tolling Scenario D, there would be an increase in traffic volumes westbound/New Jersey-bound on the George Washington Bridge during the AM, MD, and PM peak hours of 87/826/414 vehicles, respectively. It is anticipated that the increase in traffic volumes would

be within 5 percent during the AM and PM peak hours. During the MD peak hour, it is expected that there would be sufficient capacity to accommodate the additional 826 vehicles given there are two levels on the George Washington Bridge; therefore, an adverse traffic effect under SEQRA ***[criteria]*** is not anticipated.

- **Trans-Manhattan Expressway:** Under Tolling Scenario D, there would be an increase in traffic volumes westbound/New Jersey-bound on the Trans-Manhattan Expressway during the AM, MD, and PM peak hours of 76/660/313 vehicles. It is anticipated that the increase in traffic volumes would be within 5 percent during the AM and PM peak hours. The increases in traffic volumes during the MD peak hour is expected to exceed 5 percent and there is a potential adverse effect under SEQRA ***[criteria]***, depending on the available capacity to handle additional traffic.
- **Cross Bronx Expressway:** Under Tolling Scenario D, there would be an increase in traffic volumes westbound/New Jersey-bound on the Cross Bronx Expressway during the AM, MD, and PM peak hours of 61/200/108 vehicles, respectively. It is anticipated that the increase in traffic volumes would be within 5 percent during the AM and PM peak hours. The increases in traffic volumes during the MD peak hour is expected to exceed 5 percent, and there is a potential adverse effect under SEQRA ***[criteria]***, depending on the available capacity to handle additional traffic.
- **FDR Drive/Lower East Side:** The BPM analyses showed a potential 5 to 9 percent increase in daily traffic volumes along the northbound FDR Drive and a 14 to 22 percent increase in daily traffic volumes in the southbound direction in the Lower East Side. Under the SEQRA criteria based on normal traffic fluctuation, there would no adverse effect during the AM and MD peak hours and the additional increment would be absorbed due to the available capacity. During the PM peak hour, these increases in traffic volumes have the potential of creating increased queue lengths and delays during certain peak hours and an anticipated adverse traffic effect under SEQRA ***[criteria]***.

In summary, there are potential adverse traffic effects during certain peak hours under the analyzed tolling scenario with the highest increase in traffic along three of the 10 highways analyzed based upon the volume increase criteria used for a preliminary assessment of potential adverse traffic effects under SEQRA along the Long Island Expressway (I-495), the Trans-Manhattan/Cross Bronx Expressway (I-95), and the lower FDR Drive, between East 10th Street and the Brooklyn Bridge.

Adverse effects that would arise if Tolling Scenario D or another similar tolling scenario were implemented will be minimized through implementing Transportation Demand Management measures such as ramp metering, motorist information, signage, and/or targeted toll policy modifications to reduce diversions. The Project Sponsors will undertake monitoring of traffic patterns specifically tailored to the adopted tolling scenario—commencing prior to implementation with data collection approximately three months after the start of Project operations—to determine whether the predicted adverse effects are occurring and to determine the appropriate Transportation Demand Management measures (or improvement in existing Transportation Demand Management measures) to be implemented. The monitoring program will examine changes in traffic volumes, changes in speeds, and changes in delays along the affected highway corridors. Volume changes will be determined from before/after traffic counts (where available); speed changes will be determined from actual before/after speeds based on data provided by StreetLight Data, Inc.; and the

change in delay along major highway corridors will be determined based on actual speeds based on data provided by StreetLight Data, Inc. The monitoring program will inform the development and implementation of appropriate Transportation Demand Management measures and *[subsequent]* possible adjustments to the tolling policy should traffic volumes increase by more than 5 percent and delays increase 2.5 minutes *[or more]*. Although some increases in traffic volumes and travel times are expected along the *[Trans-Manhattan Expressway, the]* Long Island Expressway*[, and the lower FDR Drive due to diverted traffic]*, there would be comparable decreases in traffic volumes, travel times and delays for motorists *[along routes from which traffic diverted. These routes]* would see a higher reduction in traffic volumes under Tolling Scenario D.

Given the few locations where there is a potential for adverse traffic effects along highways leading to and from the Manhattan CBD and circumferential highways, the offsetting reductions in traffic volumes and improvements in travel times along routes from which traffic would divert, reductions in travel times and delays within the CBD portion of the trip, and the overall Project benefits in the Manhattan CBD and regionally due to a reduction in vehicular travel, the Project when viewed holistically would not have an adverse effect on traffic.

Table 4B-27. Potential Adverse Traffic Effects on Highway Segments – SEQRA

HIGHWAY SEGMENT		TOLLING SCENARIO D		
		AM	MD	PM
Long Island Expressway (I-495)	Leading to the Queens-Midtown Tunnel	No Adverse Effect	SEQRA	No Adverse Effect
George Washington Bridge Approach – Westbound	George Washington Bridge	No Adverse Effect	No Adverse Effect	No Adverse Effect
	Trans-Manhattan Expressway (I-95)	No Adverse Effect	SEQRA	No Adverse Effect
	Cross Bronx Expressway	No Adverse Effect	SEQRA	No Adverse Effect
FDR Drive	Northbound Brooklyn Bridge to East 10th Street	No Adverse Effect	No Adverse Effect	SEQRA
	Southbound East 10th Street to the Brooklyn Bridge	No Adverse Effect	No Adverse Effect	SEQRA

Source: WSP, 2022.
Note: SEQRA indicates potential adverse effect under the New York State Environmental Quality Review Act.
* Estimated values

4B.5 POTENTIAL TRAFFIC EFFECTS ON CENTRAL PARK ROADWAYS

All tolling scenarios would result in overall lower traffic volumes along roadways within and abutting Central Park. Tolling scenarios without crossing credits would have the highest reduction in traffic volumes while tolling scenarios with crossing credits would have lower reductions in traffic volumes. Tolling Scenario F—with all Manhattan crossing credits—was determined to produce the least reduction in traffic volumes within Central Park and surrounding roadways.

Figure 4B-12 shows the percentage change in daily traffic along roadways within Central Park as well as roadways surrounding the park for Tolling Scenario F. All roadways abutting the park—including Central Park West, Fifth Avenue, 110th Street, and 59th Street—are expected to have about 10 percent lower traffic volumes during all time periods. All transverse roadways through the park at 96/97th Streets, 86th Street, 79th Street, Terrace Drive, and 65th Street would also be expected to have lower traffic volumes (about 5 percent to 10 percent less) compared to the No Action Alternative.

Based on an evaluation of the tolling scenario that would result in the highest increase in traffic volumes at certain locations, there would generally be lower traffic along roadways in Central Park and the roadways surrounding the park; therefore, there would not be an adverse traffic effect at Central Park.

Figure 4B-12. Effects of CBD Tolling Alternative on Central Park Traffic

Source: WSP, 2022.

4B.6 INTERSECTION IMPACT ASSESSMENT

4B.6.1 Methodology[24]

DEFINITION OF STUDY AREAS

To evaluate the potential localized traffic effects of the Project, multiple study areas were defined based on the key entry points to the CBD tolling district, including along the 60th Street Manhattan CBD boundary and on either side of the bridges and tunnels that enter and exit the Manhattan CBD. **Figure 4B-13** shows the local study areas or intersection data collection zones identified as focal points for changes in travel patterns with CBD tolling.[25] A total of 102 intersections were identified and were aggregated into 15 study areas. Similar to the highway impacts, many of these study areas were identified through the public outreach process at locations where communities expressed concerns regarding the potential impacts of more local traffic changes. Those intersections are the locations that would most likely experience increases in traffic under the various tolling scenarios, as identified by the BPM. The 15 study areas follow:

- Brooklyn Bridge/Manhattan Bridge–Downtown Brooklyn
- Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan Brooklyn Bridge, and Manhattan Bridge
- Hugh L. Carey Tunnel–Red Hook
- Holland Tunnel–Jersey City, New Jersey
- Lincoln Tunnel–Manhattan
- Ed Koch Queensboro Bridge–East Side at 60th Street–Manhattan
- West Side at 60th Street–Manhattan
- Queens-Midtown Tunnel/Ed Koch Queensboro Bridge–Long Island City–Queens
- Queens-Midtown Tunnel–Murray Hill–Manhattan
- Robert F. Kennedy Bridge–Astoria–Queens
- Robert F. Kennedy Bridge–The Bronx
- Robert F. Kennedy Bridge–125th Street–Manhattan
- West Side Highway/Route 9A at West 24th Street–Manhattan
- Lower East Side–Manhattan
- Little Dominican Republic–Manhattan

The local intersections at the New Jersey and Manhattan approaches to the George Washington Bridge and the New Jersey approach to the Lincoln Tunnel were not included because traffic at those intersections connects primarily to regional highways and not local streets.

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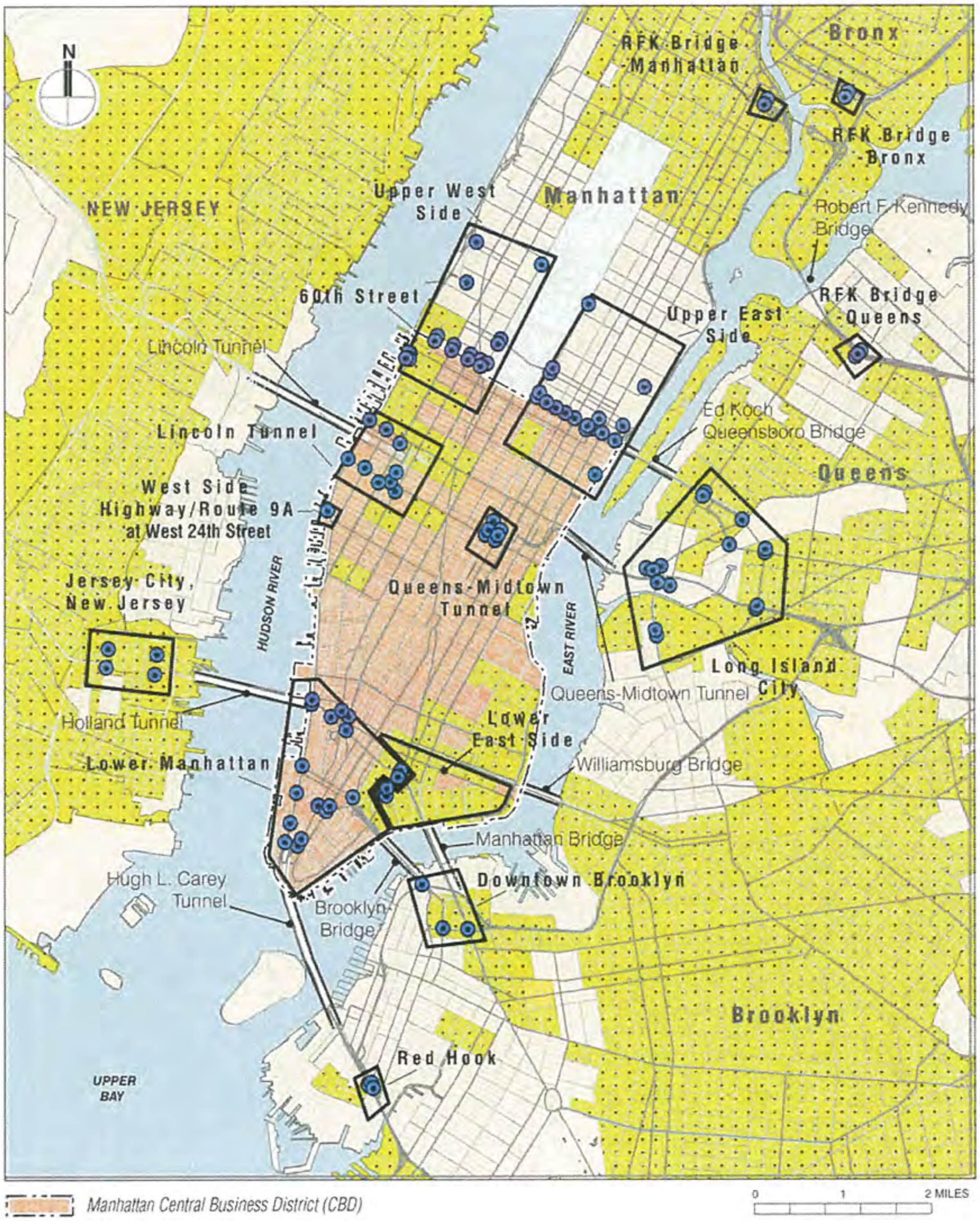
24 Detailed methodology is contained in **Appendix 4B.1, "Transportation: Transportation and Traffic Methodology for NEPA."**

25 Data collection was performed in 2019 prior to the COVID-19 pandemic. Earlier data from 2016 and 2018 from previous studies were used to supplement the data collected in 2019.

Figure 4B-13. Local Intersections and Data Collection Zones



Manhattan Central Business District (CBD)
Intersection Data Collection Zones
Environmental Justice Census Tracts
Analysis Locations

*Broadway & West 179th Street location is located north of illustrated map extent, though demonstrates *No Adverse Impact*

Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

ANALYSIS HOURS

The analysis periods—weekday AM, MD, PM, and LN—were based on the existing peak time periods, which were assumed to be same under the various tolling scenarios. It was assumed that the volume of diverted traffic would be higher during the off-peak periods when Manhattan CBD crossings would be less congested and better able to accommodate diverted traffic. The actual analysis hour was determined by reviewing the highest volumes from the Automatic Traffic Recorder (ATR) counts and transaction data, and through consultation with NYCDOT. **Table 4B-28** shows the peak hours varied by study area based on the available data that does not include LN information at certain locations.

Table 4B-28. Peak Hours by Study Area

	STUDY AREA	WEEKDAY			
		AM	MD	PM	LN[1]
1	Downtown Brooklyn	8 to 9	1 to 2	5 to 6	9 to 10
2	Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan	8 to 9	1 to 2	5 to 6	—
3	Hugh L. Carey Tunnel–Red Hook	7:45 to 8:45	12 to 1	4 to 5	9 to 10
4	Holland Tunnel–Jersey City	8 to 9	12 to 1	5 to 6	—
5	Lincoln Tunnel–Manhattan	8 to 9	1 to 2	5 to 6	—
6	East Side at 60th Street–Manhattan	8 to 9	1 to 2	5 to 6	9 to 10
7	West Side at 60th Street–Manhattan	8 to 9	1 to 2	5 to 6	9 to 10
8	Queens-Midtown Tunnel/Ed Koch Queensboro Bridge–Long Island City	7 to 8	1 to 2	5 to 6	—
9	Queens-Midtown Tunnel–Manhattan	8 to 9	1 to 2	5 to 6	9 to 10
10	Robert F. Kennedy Bridge–Queens	7:15 to 8:15	12:30 to 1:30	4 to 5	9:45 to 10:45
11	Robert F. Kennedy Bridge–The Bronx	8 to 9	1 to 2	5 to 6	9 to 10
12	Robert F. Kennedy Bridge–Manhattan	7:45 to 8:45	1 to 2	4 to 5	9:45 to 10:45
13	West Side Highway/Route 9A at West 24th Street–Manhattan[2]	8 to 9	1 to 2	5 to 6	9 to 10
14	Lower East Side–Manhattan	8 to 9	1 to 2	5 to 6	—
15	Little Dominican Republic–Manhattan	7 to 8	3 to 4	5 to 6	—

Source: WSP analysis of traffic count data, 2019.

1 Late night data not available in some study areas.

2 This location is treated separately because it is between the Hugh L. Carey Tunnel and Holland Tunnel—Lower Manhattan study area and the Lincoln Tunnel—Manhattan study area.

2023 NO ACTION ALTERNATIVE AND CBD TOLLING ALTERNATIVE (TOLLING SCENARIO D) INTERSECTION TRAFFIC VOLUMES

The No Action Alternative intersection traffic volumes were estimated from the BPM results at each intersection for each of the four analysis hours. The No Action Tolling Alternative traffic volumes were estimated for each intersection by adding the 2023 No Action Alternative increment to the 2019 existing traffic volumes to account for changes in the roadway network and intersections already implemented or planned to be implemented by 2023.

Incremental traffic volumes were estimated for Tolling Scenario D[26] at each intersection for each of the four analysis hours from the BPM results.*[[27]]* The 2023 CBD Tolling Alternative traffic volumes were estimated for each intersection by adding the adjusted 2023 increment to the 2023 No Action Alternative traffic volumes to account for changes in the roadway network and geometry changes at intersections already implemented or planned to be implemented by NYCDOT by 2023.

INTERSECTION LEVEL OF SERVICE

Table 4B-29 shows the criteria used to determine intersection LOS for signalized and unsignalized intersections, according to the *Highway Capacity Manual*:[28]

- LOS A, B, and C reflect clearly acceptable traffic conditions.
- LOS D reflects the existence of delays within a generally tolerable range in dense urban environments.
- LOS E and F indicate levels of congestion.

DETERMINING ADVERSE TRAFFIC EFFECTS

For periodic increases in tolling on its bridges, TBTA has historically conducted environmental assessments using SEQRA criteria as a guideline, as well as other considerations, in determining whether a proposed action would result in adverse traffic effects on local intersections.

Under the SEQRA criteria used for many years by NYSDOT and other agencies for projects in the region (including National Environmental Policy Act documents with FHWA as the lead agency such as *Hunts Point Interstate Access Improvement Project EIS* and the *Miller Highway Reconstruction EIS*), an increase threshold of equal to or greater than 10 seconds in average intersection delays at LOS E or LOS F has been used as criteria to determine adverse traffic effects. Several SEQRA analyses by TBTA and other agencies have applied a more conservative criteria of an increase in average intersection delay of greater than 5 seconds at LOS E or LOS F to determine a traffic impact. At LOS D or better, the 5-second threshold could be exceeded if the LOS does not worsen to LOS E or LOS F.

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26 An additional traffic analysis was done for the Downtown Brooklyn study area where Tolling Scenario C was determined to be the representative tolling scenario.

[27 For the Final EA, the Project Sponsors committed to additional mitigation measures (see Chapter 16, "Summary of Effects," Table 16-2). These new mitigation commitments neither require a change in the tolling scenarios used for the analyses in the EA nor change the fundamental conclusions of the EA (see Chapter 3, "Environmental Assessment Framework," Section 3.3.3).]

28 *Highway Capacity Manual* (2010)

Table 4B-29. Level of Service Average Control Delay Criteria

	LEVEL OF SERVICE	SIGNALI ED INTERSECTIONS AVERAGE CONTROL DELAY (sec/veh)	UNSIGNALI ED INTERSECTIONS AVERAGE CONTROL DELAY (sec/veh)
	A	≤ 10	≤ 10
	B	> 10 and ≤ 20	> 10 and ≤ 15
	C	> 20 and ≤ 35	> 15 and ≤ 25
	D	> 35 and ≤ 55	> 25 and ≤ 35
	E	> 55 and ≤ 80	> 35 and ≤ 50
	F	80	50

Source: *Highway Capacity Manual*. 2010. Transportation Research Board, National Research Council, Washington DC.

CALIBRATION OF SYNCHRO MODELS

For calibration of Synchro models, NYCDOT provided guidance for intersection performance analysis to reflect prevailing traffic operational conditions based on count data and field observation, including volume and peak-hour factors, parking and curbside lane movements, pedestrian conflicts, and other physical and operational characteristics.

4B.6.2 Affected Environment (including No Action Alternative)

Appendix 4B.2, "Transportation: Traffic Flow Maps" and Appendix 4B.3, "Transportation: Traffic LOS Existing and No Action," presents volume maps and Synchro analysis results for existing conditions and the No Action Alternative for the intersections in the 15 study areas. The following sections summarize the results of the analyses by study area for existing conditions and the No Action Alternative. The No Action Alternative includes known changes that have been or will soon be implemented by NYCDOT, most notably including an additional bicycle lane on the Ed Koch Queensboro Bridge and Brooklyn Bridge, reduction in moving lanes on the BQE between Atlantic Avenue and Sands Street, and updated intersection geometries and signal-timings.

DOWNTOWN BROOKLYN STUDY AREA

In the downtown Brooklyn study area, three intersections were examined:

- AM Peak:
  - During the existing AM peak, 1 intersection operates at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E and 1 intersection would operate at LOS F.
- MD Peak:
  - During the existing MD peak, 1 intersection operates at LOS E and no intersection operate at LOS F.
  - During the No Action Alternative MD peak, 1 intersection would operate at LOS E and no intersection would operate at LOS F.
- PM Peak:
  - During the existing PM peak, 1 intersection operates at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative PM peak, 1 intersection would operate at LOS E and no intersection would operates at LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F

HUGH L. CAREY TUNNEL AND HOLLAND TUNNEL–LOWER MANHATTAN STUDY AREA

In the Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan study area, the analysis included 15 intersections:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, 2 intersections would operate at LOS E and no intersection would operate at LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E and 1 intersection operates at LOS F.
  - During the No Action Alternative PM peak, 1 intersection would operate at LOS E and 1 intersection would operate at LOS F.
- LN Peak:
  - The Synchro model for these intersections did not include LN data and based on lower overall nighttime existing conditions and No Action Alternative volumes, no further evaluation was warranted.

HUGH L. CAREY TUNNEL–RED HOOK STUDY AREA

In the Hugh L. Carey Tunnel–Red Hook study area, the analysis included two intersections:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

HOLLAND TUNNEL–JERSEY CITY STUDY AREA

In the Holland Tunnel–Jersey City study area, 4 intersections were examined:

- AM Peak:
  - During the existing AM peak, 2 intersections operate at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative AM peak, 2 intersections would operate at LOS E and 1 intersection would operate at LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, 2 intersections operate at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative PM peak, 3 intersections would operate at LOS E and no intersection would operate at LOS F.
- LN Peak:
  - The Synchro model for these intersections did not include LN data and based on lower overall nighttime existing conditions and No Action Alternative volumes, no further evaluation was warranted.

LINCOLN TUNNEL–MANHATTAN STUDY AREA

In the Lincoln Tunnel–Manhattan study area, 9 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - The Synchro model for these intersections did not include LN data and based on lower overall nighttime existing conditions and No Action Alternative volumes, no further evaluation was warranted.

EAST SIDE AT 60TH STREET–MANHATTAN STUDY AREA

In the East Side at 60th Street–Manhattan study area, 17 signalized intersections and 2 unsignalized intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, 1 intersection would operate at LOS E and no intersection would operates at LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, 1 intersection would operate at LOS E and no intersection would operates at LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

WEST SIDE AT 60TH STREET–MANHATTAN STUDY AREA

In the West Side at 60th Street–Manhattan study area, 19 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, 1 intersection operates at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative MD peak, 1 intersection would operate at LOS E and no intersection would operate at LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

QUEENS-MIDTOWN TUNNEL–MANHATTAN STUDY AREA

In the Queens-Midtown Tunnel–Manhattan study area, 6 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E and 1 intersection would operate at LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E and 1 intersection would operate at LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

QUEENS-MIDTOWN TUNNEL/ED KOCH QUEENSBORO BRIDGE–LONG ISLAND CITY STUDY AREA

In the Queens-Midtown Tunnel–Long Island City study area, 13 intersections were examined, including 4 unsignalized intersections:

- AM Peak:
  - During the existing AM peak, 2 intersections operate at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative AM peak, 2 intersections would operate at LOS E and no intersection would operate at LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, 1 intersection operates at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative PM peak, 3 intersections would operate at LOS E and no intersection would operate at LOS F.
- LN Peak:
  - The Synchro model for these intersections did not include LN data and based upon the lower overall nighttime existing conditions and No Action Alternative volumes, no further evaluation was warranted.

RFK BRIDGE–QUEENS STUDY AREA

In the RFK Bridge–Queens study area, 3 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E and 1 intersection operates at LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E and 1 intersection would operate at LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

RFK BRIDGE–BRONX STUDY AREA

In the RFK Bridge–Bronx study area, 2 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the projected No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

RFK BRIDGE–MANHATTAN STUDY AREA

In the RFK Bridge–Manhattan study area, 2 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

WEST SIDE HIGHWAY/ROUTE 9A AT WEST 24TH STREET–MANHATTAN STUDY AREA

In the West Side Highway/Route 9A at West 24th Street–Manhattan study area,[29] only 1 intersection was examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the projected No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

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[29] This location is treated separately because it is between the Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan Study Area and the Lincoln Tunnel–Manhattan study area.

LOWER EAST SIDE–MANHATTAN STUDY AREA

In the Lower East Side study area, 3 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - The Synchro model for these intersections did not include LN data and based upon the lower overall nighttime existing conditions and No Action Alternative volumes, no further evaluation was warranted.

LITTLE DOMINICAN REPUBLIC–MANHATTAN STUDY AREA

In the Little Dominican Republic–Manhattan study area, 1 intersection was examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - The Synchro model for these intersections did not include LN data and based upon the lower overall nighttime existing conditions and No Action Alternative volumes, no further evaluation was warranted.

4B.6.3 Environmental Consequences

POTENTIAL TRAFFIC EFFECTS AT INTERSECTIONS

Based on the BPM analysis, Tolling Scenario D was identified as having the most number of intersection locations with a potential increase of 50 or more vehicles. Therefore, all 102 intersections were analyzed for Tolling Scenario D. An additional analysis was performed in the Downtown Brooklyn study area for Tolling Scenario C since that tolling scenario produced a larger number of intersections with an increase of 50 or more vehicles.

The Synchro model was used to analyze the No Action Alternative and CBD Tolling Alternative at each intersection during the AM, MD, PM and LN peak hours.[30] The change in average intersection delays was used to assess potential traffic effects. TBTA adopted an increase of more than 5 seconds average intersection delay at LOS E or F as the criteria for determining the significance of traffic effects under SEQRA. Increases in intersection delays greater than 5 seconds are not considered an adverse effect if the resulting LOS is D or better.

Table 4B-30 summarizes the results of the intersection analyses identifying those intersections where the SEQRA criteria used by TBTA of more than 5 seconds increase in delay would be exceeded. Potential adverse traffic effects were identified at a total of 4 intersections out of 102 intersections analyzed during one or more peak hours. Signal-timing improvements would mitigate any potential adverse traffic effects at all locations.

Table 4B-30. Potential Traffic Effects at Intersections With and Without Signal-Timing Improvements

TOLLING SCENARIO D STUDY AREA	INTERSECTION NAME	ANALYSIS PERIOD	WITHOUT IMPROVEMENTS SEQRA Impact	WITH IMPROVEMENTS SEQRA Impact
Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan	Trinity Place and Edgar Street	MD	Yes	No
Queens-Midtown Tunnel–Manhattan	East 36th Street and Second Avenue	MD	Yes	No
	East 37th Street and Third Avenue	LN	Yes	No
Robert F. Kennedy Bridge–Manhattan	East 125th Street and Second Avenue	AM	Yes	No
		PM	Yes	No

Source: WSP, 2022.
Note: Results of analysis for all intersections can be found in **Appendix 4B.5, "Transportation: Traffic LOS, CBD Tolling Alternative with Mitigation."**

DOWNTOWN BROOKLYN STUDY AREA

A detailed traffic analysis was performed at three intersections within this study area. The results of the analysis for the AM, MD, and PM peak hours, showed that none of the intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an

30 Pre-COVID-19-pandemic intersection counts were available at only 64 of the 102 intersections analyzed during the LN peak.

adverse traffic effect; therefore, there would not be an adverse traffic impact in the Downtown Brooklyn study area.

HUGH L. CAREY TUNNEL AND HOLLAND TUNNEL–LOWER MANHATTAN STUDY AREA

A detailed traffic analysis was performed at 15 intersections within this study area. The results of the analysis for the AM, MD, and PM peak hours, without and with traffic signal-timing improvements, are described below at the potentially affected locations.

Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan Study Area—Without Signal-Timing Improvements

AM PEAK HOUR (8:00 a.m. to 9:00 a.m.)

No intersections with an increase in delay would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the AM peak hour; therefore, there would not be an adverse traffic impact during the AM peak hour.

MD PEAK HOUR (1:00 p.m. to 2:00 p.m.)

One intersection would have a potential increase in delays that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect as described below:

- **SEQRA Impacts:**
  - **Trinity Place (NB-SB) and Edgar Street (EB):** Under the No Action Alternative, this intersection would operate at LOS C, with an overall intersection delay of 24.7 seconds. With the CBD Tolling Alternative, the overall intersection delay would increase by 65.5 seconds to 90.2 seconds, due to the addition of 98 vehicles to the intersection. Under the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect the increase in average intersection delay would exceed the allowable increase in delay.

PM PEAK HOUR (5:00 p.m. to 6:00 p.m.)

No intersections with an increase in delay would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the PM peak hour; therefore, there would not be an adverse traffic effect during the PM peak hour.

Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan Study Area—With Signal-Timing Improvements

With traffic signal-timing improvements no intersections would have potential increases in delay that exceed the SEQRA threshold used to determine whether there would be an adverse traffic effect.

MD PEAK HOUR (1:00 p.m. to 2:00 p.m.)

- **SEQRA Impacts:**
  - **Trinity Place (NB–SB) and Edgar Street (EB):** With signal retiming, this intersection would operate at LOS C with a delay of 32.4 seconds, which would be 7.7 seconds greater than the No Action Alternative. This would result in a delay increase below the *SEQRA* threshold and there would be no adverse effect.

HUGH L. CAREY TUNNEL–RED HOOK STUDY AREA

A detailed traffic analysis was performed at two intersections within this study area. The results of the analysis for the AM, MD, PM, and LN peak hours showed that none of the intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect in the Hugh L. Carey Tunnel—Red Hook study area.

HOLLAND TUNNEL–JERSEY CITY, NEW JERSEY, STUDY AREA

A detailed traffic analysis was performed at four intersections within this study area. The results of the analysis for the AM, MD, and PM peak hours showed that none of the intersections would have an increase in delay that would exceed the SEQRA criteria used by TBTA.

LINCOLN TUNNEL–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at nine intersections within the study area. The results of the analysis for the AM, MD, and PM peak hours showed that none of the intersections had an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the Lincoln Tunnel—Manhattan study area.

EAST SIDE AT 60TH STREET–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at 19 intersections in the study area. The results of the analysis for the AM, MD, PM, and LN peak hours showed that none of the intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the East Side 60th Street—Manhattan study area.

WEST SIDE AT 60TH STREET–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at 19 intersections in the study area. The results of the analysis for the AM, MD, PM, and LN peak hours showed that none of the intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the West Side 60th Street - Manhattan study area.

QUEENS-MIDTOWN TUNNEL–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at six intersections within the study area. The results of the analysis for the AM, MD, PM, and LN peak hours, with and without traffic signal-timing improvements, are described below at the potentially affected locations.

Queens-Midtown Tunnel–Manhattan—Without Signal-Timing Improvements

AM PEAK HOUR (8:00 a.m. to 9:00 a.m.)

No intersections had an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the AM peak hour; therefore, there would not be an adverse traffic impact during the AM peak hour.

MD PEAK HOUR (1:00 p.m. to 2:00 p.m.)

One intersection would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect. The exceedances are described below:

- **SEQRA Impacts:**
  - **East 36th Street (EB) and Second Avenue (SB):** This intersection would operate at LOS F, with an overall intersection delay of 106.1 seconds, under the No Action Alternative. With the CBD Tolling Alternative, the overall intersection delay would increase by 15 seconds to 121.1 seconds, due to the addition of 16 vehicles to the intersection. Under the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect, the increase in delay would exceed the maximum allowable increase in delay.

PM PEAK HOUR (5:00 p.m. to 6:00 p.m.)

No intersections had an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the PM peak hour; therefore, there would not be an adverse traffic impact during the PM peak hour.

LN PEAK HOUR (9:00 p.m. to 10:00 p.m.)

One intersection would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect. The exceedances are described below:

- **SEQRA Impacts:**
  - **East 37th Street (WB) and Third Avenue (NB):** This intersection would operate at LOS C, with an overall intersection delay of 21.8 seconds, under the No Action Alternative. With the CBD Tolling Alternative, the overall intersection delay would increase by 41.1 seconds to 62.9 seconds, due to the addition of 62 vehicles to the intersection. Under the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect, the increase in delay would exceed the maximum allowable increase in delay.

Queens-Midtown Tunnel–Manhattan Study Area—With Signal-Timing Improvements

With traffic signal-timing improvements no intersections would have potential increases in delay that exceed the SEQRA threshold used to determine whether there would be an adverse traffic effect.

MD PEAK HOUR (1:00 p.m. to 2:00 p.m.)

- **SEQRA Impacts:**
  - **East 36th Street (EB) and Second Avenue (SB):** With signal retiming, this intersection would operate at LOS F with a delay of 109.7 seconds, which would be 3.6 seconds greater than the No Action Alternative. This would result in a delay increase below the SEQRA threshold and there would be no adverse effect.

LN PEAK HOUR (9:00 p.m. to 10:00 p.m.)

- **SEQRA Impacts:**
  - **East 37th Street (WB) and Third Avenue (NB):** With signal retiming, this intersection would operate at LOS C with a delay of 26.5 seconds, which would be 4.7 seconds greater than the No Action Alternative. This would result in a delay increase below the SEQRA threshold and there would be no adverse effect.

QUEENS-MIDTOWN TUNNEL/ED KOCH QUEENSBORO BRIDGE–LONG ISLAND CITY STUDY AREA

A detailed traffic analysis was performed at 13 intersections in this study area. The results of the analysis for the AM, MD, and PM peak hours showed that none of the intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the Queens-Midtown Tunnel/Ed Koch Queensboro Bridge–Long Island City study area.

RFK BRIDGE–QUEENS STUDY AREA

A detailed traffic analysis was performed at three intersections in the study area. The results of the analysis for the AM, MD, PM, and LN peak hours showed that no intersections would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the RFK Bridge–Queens study area.

RFK BRIDGE–BRONX STUDY AREA

A detailed traffic analysis was performed at two intersections in the study area. The results of the analysis for the AM, MD, PM, and LN peak hours showed that no intersections would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the RFK Bridge–***[Bronx]*** study area.

RFK BRIDGE–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at two intersections in the study area. The results of the analysis for the AM, MD, PM, and LN peak hours, without and with traffic signal-timing improvements, are described below at the potentially affected locations.

RFK Bridge–Manhattan Study Area — Without Signal-Timing Improvements

AM PEAK HOUR (8:00 a.m. to 9:00 a.m.)

One intersection would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the AM peak hour. All exceedances are described below:

- **SEQRA Impacts:**
  - **East 125th Street (EB–WB), Second Avenue (SB), RFK Bridge Exit (SW):** This intersection would operate at LOS C, with an overall intersection delay of 34.9 seconds, under the No Action Alternative. With the CBD Tolling Alternative, the overall intersection delay would increase by

20.4 seconds to 55.3 seconds, due to the addition of 17 vehicles to the intersection. Under the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect, the increase in delay would exceed the maximum allowable increase in delay.

MD PEAK HOUR (1:00 p.m. to 2:00 p.m.)

No intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the MD peak hour.

PM PEAK HOUR (5:00 p.m. to 6:00 p.m.)

One intersection would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the PM peak hour. All exceedances are described below:

- **SEQRA Impacts:**
  - **East 125th Street (EB–WB), Second Avenue (SB), RFK Bridge Exit (SW)—Southwest-bound Left:** This intersection would operate at LOS C, with an overall intersection delay of 25 seconds, under the No Action Alternative. With the CBD Tolling Alternative, the overall intersection delay would increase by 52.2 seconds to 77.2 seconds, due to the additional vehicles to specific lane groups. Under the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect, the increase in delay would exceed the maximum allowable increase in delay.

LN PEAK HOUR (9:45 p.m. to 10:45 p.m.)

No intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the LN peak hour.

RFK Bridge–Manhattan Study Area—With Signal-Timing Improvements

With signal-timing improvements in place, no intersections would have potential increases in delay that would exceed the SEQR threshold.

AM PEAK HOUR (8:00 a.m. to 9:00 a.m.)

- **SEQRA Impacts:**
  - **East 125th Street (EB-WB), Second Avenue (SB), RFK Bridge Exit (SW):** With signal retiming, this intersection would operate at LOS D with a delay of 37.8 seconds, which would be 2.9 seconds greater than the No Action Alternative. This would result in a delay increase below the SEQRA threshold and there would be no adverse effect.

PM PEAK HOUR (5:00 p.m. to 6:00 p.m.)

- **SEQRA Impacts:**
  - **East 125th Street (EB–WB), Second Avenue (SB), RFK Bridge Exit (SW):** With signal retiming, this intersection would operate at LOS D with a delay of 36.2 seconds, which would be 11.2 seconds greater than the No Action Alternative. This would result in a LOS improvement that does not exceed the SEQRA threshold and there would be no adverse effect.

WEST SIDE HIGHWAY/ROUTE 9A AT WEST 24TH STREET–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at one intersection in the study area.[31] The results of the analysis for the AM, MD, PM, and LN peak hours showed that no intersections would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact at this location.

LOWER EAST SIDE–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at three intersections in the study area. The results of the analysis for the AM, MD, and PM peak hours showed that no intersections would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the Lower East Side study area.

LITTLE DOMINICAN REPUBLIC–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at one intersection in the study area. The results of the analysis for the AM, MD, and PM peak hours showed that no intersections would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact at this location.

4B.6.4 Summary of Local Intersection Performance for Scenario(s) with Highest Increase in Traffic

A total of 102 intersections were analyzed during the AM, MD, PM, and, as applicable, LN peak hours in 15 study areas. These study areas and intersections were chosen for analysis based upon the likelihood of potential traffic increases and impacts.

Table 4B-31 presents a summary of the number of analyzed signalized intersections that would be expected to have an increase, decrease, or no change in delay under the analyzed tolling scenario with the highest increase in traffic volumes. The results indicate that most intersections would see reductions in delay or there would be no change in delay while there would be 73 instances (about 20 percent of all analyses) where the delay would increase. Prior to mitigation, 5 locations (about 1 percent of all analyses) would exceed the SEQRA thresholds. **Table 4B-31** shows there would be no locations where changes in delay would create adverse effects based on the SEQRA criteria of greater than a 5-second increase in average delay that could not be addressed by incorporating signal-timing improvements into the Project. Under SEQRA (thresholds used by state agencies[32]), the criteria used for determining the significance of adverse traffic effects at intersections generally varies from an increase in delay of 5 to 10 seconds per vehicle at a

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31 This location is treated separately because it is between the Hugh L. Carey and Holland Tunnel–Lower Manhattan study area and the Lincoln Tunnel–Manhattan study area.

32 *Miller Highway Reconstruction EIS* (NYSDOT 1993) used a criteria of 10 seconds or more increase in average intersection delay per vehicle at LOS E/F.
Hunts Point Access Improvements EIS (NYSDOT 2019) used a criteria of 10 seconds or more increase in delay per vehicle and a deterioration in LOS to E/F.
Fulton Street Transit Center EIS (MTA 2004) used a criteria of 10 seconds or more increase in average vehicle delay at LOS E/F.
Toll Policy EAs (TBTA 2005–2021) used a criteria of greater than a 5 second increase in average vehicle delay at LOS E/F.
Long Island Jewish Medical Center Modernization Program Final Generic EIS (Dormitory Authority of the State of New York 2009) used a criteria of greater than a 5 second increase in average intersection approach delay at LOS E/F.

deteriorated LOS E or LOS F. Increases in average delays at intersections resulting in LOS D or better are not considered significant.

Table 4B-31. Summary of Local Intersection Performance With Improvements

STUDY AREA	INTERSECTIONS	TOTAL COUNT	DELAY CHANGE (COUNT)			IMPACT COUNT (SEQRA)
			Increase	Decrease	No Change	
Downtown Brooklyn	Signalized Intersections	12	3	9	0	0
Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan	Signalized Intersections	45	16	28	1	0
Hugh L. Carey Tunnel–Red Hook	Signalized Intersections	8	4	3	1	0
Holland Tunnel–New Jersey	Signalized Intersections	12	0	12	0	0
Lincoln Tunnel–Manhattan	Signalized Intersections	27	1	26	0	0
East Side at 60th Street–Manhattan	Signalized Intersections	76	7	61	8	0
West Side at 60th Street–Manhattan	Signalized Intersections	76	9	66	1	0
Queens-Midtown Tunnel–Manhattan	Signalized Intersections	24	8	15	1	0
Queens-Midtown Tunnel/Ed Koch Queensboro Bridge–Long Island City	Signalized Intersections	39	9	19	11	0
Robert F. Kennedy Bridge	Signalized Intersections	28	9	10	9	0
West Side Highway/ Route 9A at West 24th Street	Signalized Intersections	4	0	4	0	0
Lower East Side–Manhattan	Signalized Intersections	9	4	5	0	0
Little Dominican Republic–Manhattan	Signalized Intersections	3	3	0	0	0
TOTAL	Signalized Intersections	363	73	258	32	0

Source: WSP, 2022.
Note: Numbers may not add up due to rounding.
* The Downtown Brooklyn study area was also analyzed for Tolling Scenario C, which was projected to have higher increases in traffic volumes than Tolling Scenario D. The results from Tolling Scenario C analysis are shown for Downtown Brooklyn study area.
** New Jersey locations are outside the jurisdiction of SEQRA.
*** RFK Bridge consists of the RFK–Queens, RFK–Bronx, and RFK–Manhattan study areas.

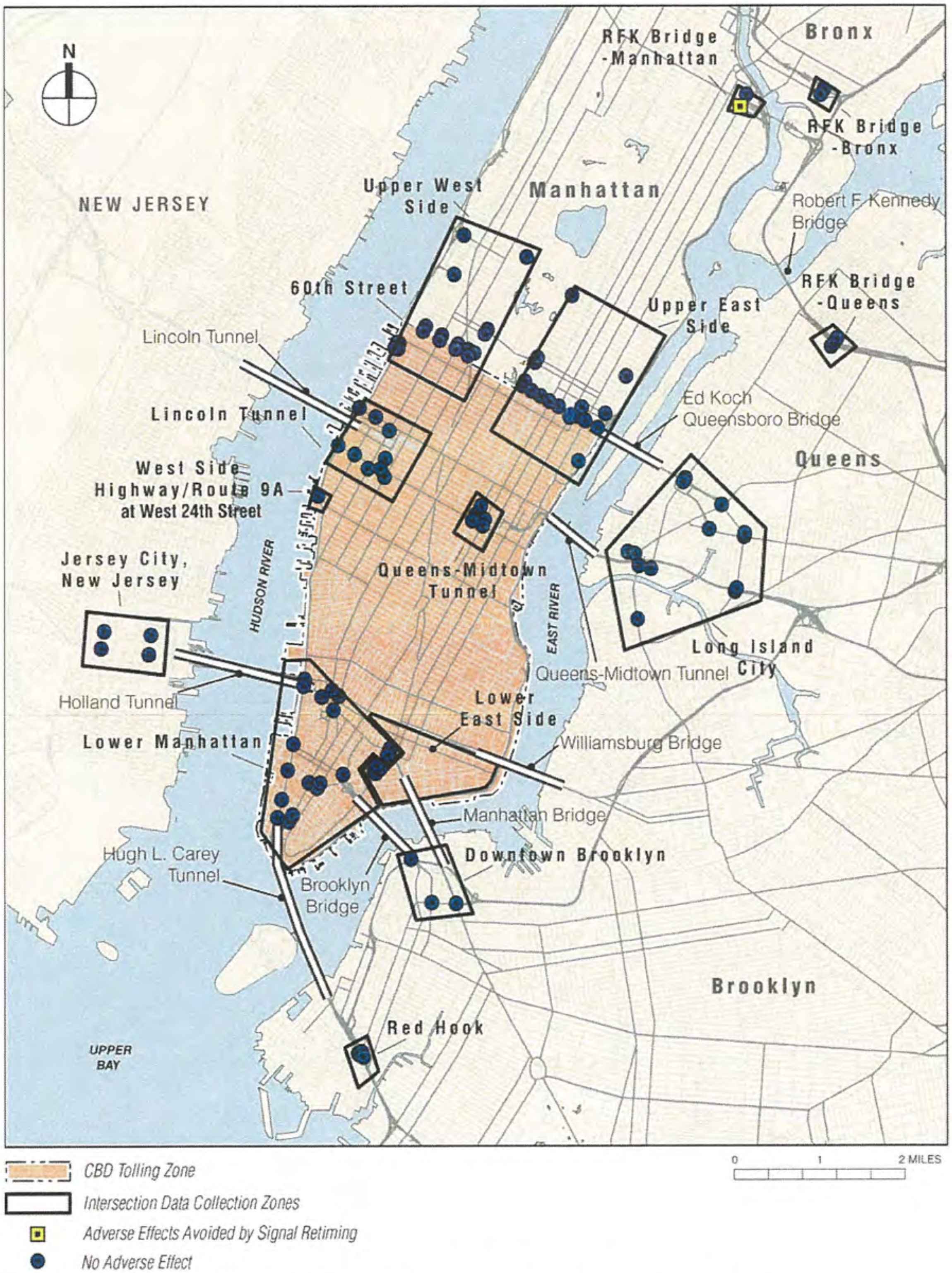
In summary, based upon the analysis of potential changes in traffic patterns, including reductions in traffic volumes and diversions associated with the range of tolling scenarios, the overall change in LOS and delay at the 102 intersections analyzed would be modest. **Figure 4B-14 through Figure 4B-17** present the study area intersections and summarize the potential effects of the Project with and without signal-timing improvements. There were four intersections (with a total of five instances) where the incremental traffic volumes would result in potential adverse effects using the SEQRA criteria with increases in average intersection delays exceeding 5 seconds without the implementation of standard traffic signal-timing improvements.

Based on a detailed traffic analysis during the AM, MD, PM, and LN peak hours at 102 key intersections most likely to experience increases in traffic volumes and delays under Tolling Scenario D with the largest increases in local traffic volumes, there would be only minor traffic effects, which can be addressed by incorporating signal-timing adjustments.[33] Similar minor traffic effects are not anticipated for Tolling Scenarios A, B, C, or G. It is expected that, with ***[NYCDOT's]*** commitment to monitor traffic conditions under all tolling scenarios, and make appropriate signal-timing changes if necessary, there would be no anticipated adverse effects from implementing the Project for any of the tolling scenarios when considering the SEQRA criteria for determining potential adverse traffic effects.

The Project Sponsors will undertake pre- and post-implementation monitoring at the four intersections with identified potential adverse effects ***[within the six months prior to]*** implementation of the Project, with post-implementation monitoring ***[within the six months after]*** the start of operations. The monitoring would be used to validate the need for, and design of, potential mitigation ***[measures]***. In line with the SEQRA criteria, the threshold for determining whether there is an adverse effect is an increase in average intersection delays exceeding 5 seconds ***[at LOS E/F]***, as described above. The Project Sponsor commits to using a toolbox of traffic operations and street design strategies (e.g., signal-timing/phasing changes, lane assignment changes, changes to curbside regulations, etc.) to mitigate adverse effects associated with the adopted tolling scenario, to the extent practicable. In addition, the robust post-implementation biennial Evaluation Report mandated by the Traffic Mobility Act will include traffic data collection at intersections in and around the Manhattan CBD and other locations of interest in the form of ATR and camera-based Vehicle Classification and Turning Movement Counts. These data will be used to identify and quantify actual traffic effects associated with the adopted tolling scenario and to inform the development of appropriate mitigation measures, if needed. Depending upon the tolling scenario selected and future unforeseen operational and geometric changes at certain intersections, it is possible that some residual traffic effects at those intersections may remain.

33 Appropriate signal-timing improvement measures would be undertaken post-implementation. The signal-timing improvements described in this document represent what may need to be done under the analyzed tolling scenario, but because the tolling scenario is to be determined by the Traffic Mobility Review Board, the actual scope and need for signal-timing improvements may change. The Project Sponsors would monitor traffic conditions at the study locations and NYCDOT would implement appropriate signal-timing changes if adverse effects are observed.

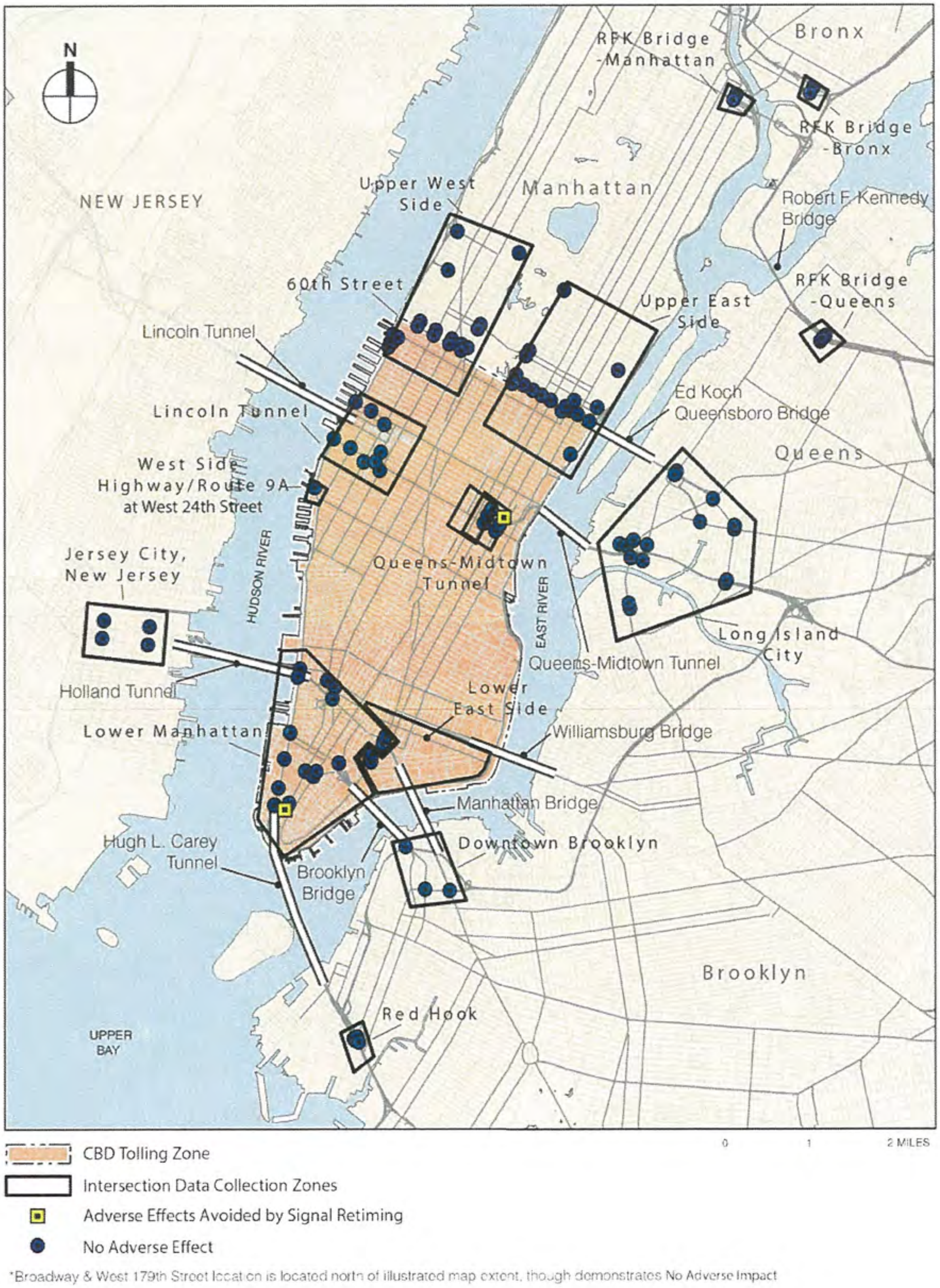
Figure 4B-14. Potential Adverse Traffic Effects at Local Intersections AM Period



*Broadway & West 179th Street location is located north of illustrated map extent, though demonstrates *No Adverse Impact*

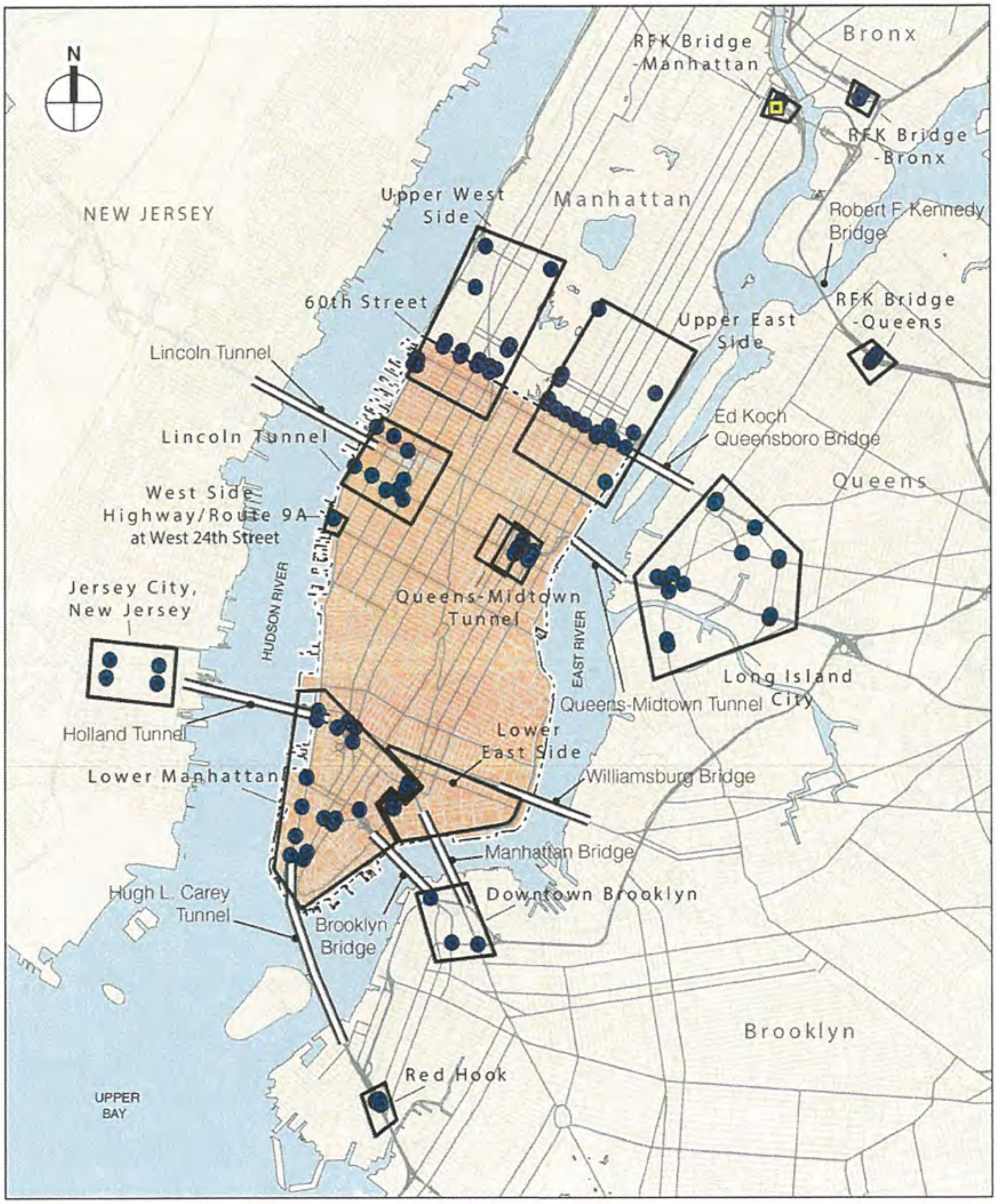
Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

Figure 4B-15. Potential Adverse Traffic Effects at Local Intersections MD Period



Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

Figure 4B-16. Potential Adverse Traffic Effects at Local Intersections PM Period



CBD Tolling Zone

Intersection Data Collection Zones

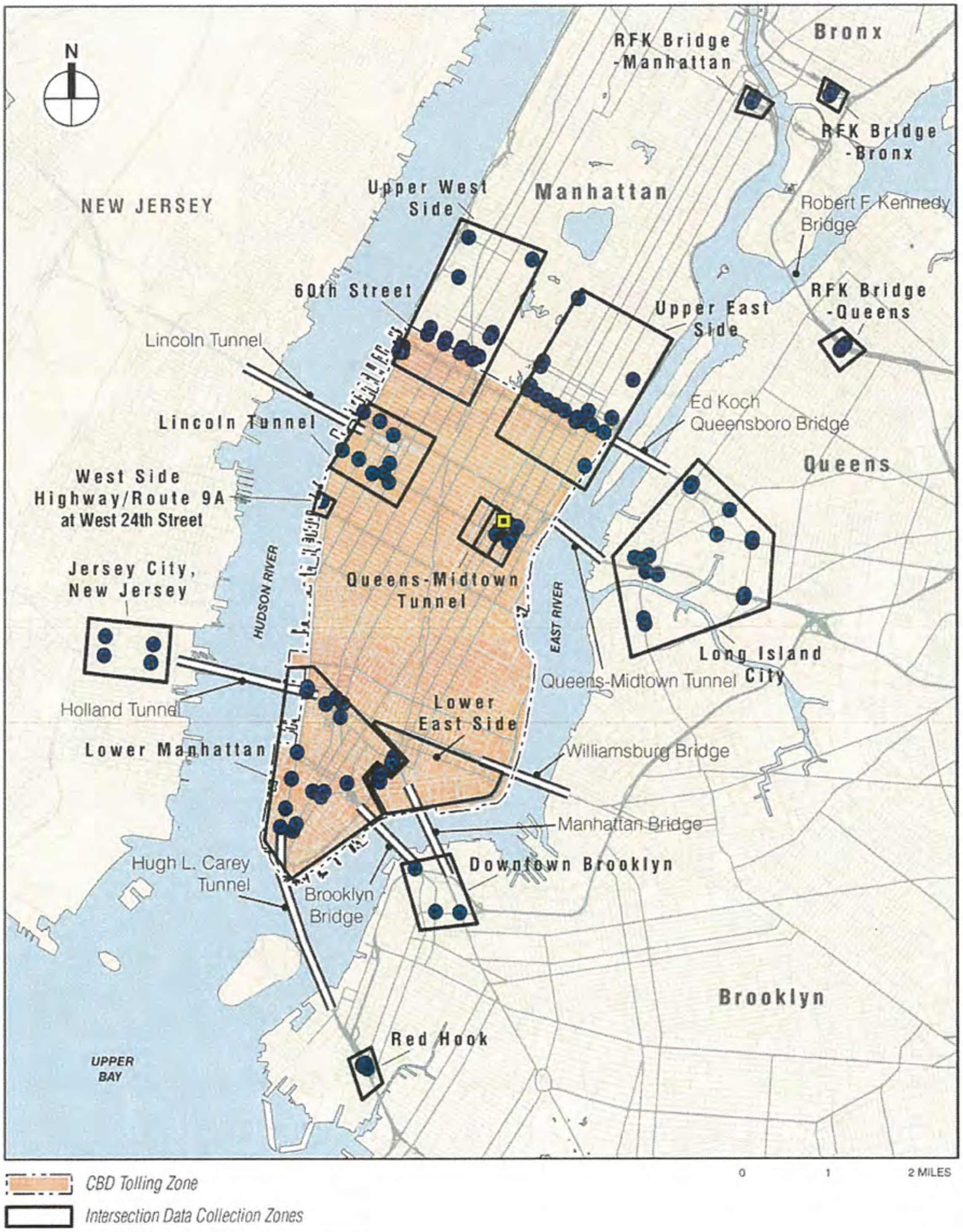
Adverse Effects Avoided by Signal Retiming

No Adverse Effect

*Broadway & West 179th Street location is located north of illustrated map extent, though demonstrates No Adverse Impact

Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

Figure 4B-17. Potential Adverse Traffic Effects at Local Intersections Late Night (LN) Period



*Broadway & West 179th Street location is located north of illustrated map extent, though demonstrates *No Adverse Impact*

Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

4B.7 CONCLUSION

Chapter 1, "Introduction," succinctly describes the level of congestion experienced by travelers to the Manhattan CBD. The low travel speeds and unreliable travel times to, from, and within the Manhattan CBD increase auto commute times, erode worker productivity, reduce bus and paratransit service quality, raise the cost of deliveries and the overall cost of doing business, and delay emergency vehicles. A 2018 analysis by Partnership for New York City—an organization that represents the city's business leadership and largest private-sector employers—predicted that congestion in the New York City region would cost businesses, commuters, and residents $100 billion over the next 5 years.[34] Thus, there is a need to reduce vehicle congestion in the Manhattan CBD to improve the reliability and efficiency of the transportation system.

In general, the Project would reduce traffic at key Manhattan CBD crossings, the approach roadways, and at intersections within the Manhattan CBD as well as intersections outside of the Manhattan CBD. However, under certain tolling scenarios, where crossings credits would be applied at currently tolled facilities, there is a potential of traffic diversion to facilities offering a toll credit. In some locations, this is beneficial as it can aid in addressing traffic imbalances already in place as certain drivers take longer routes to avoid tolls (notably at the East River Bridges). However, by raising the overall toll these same crossing credits can cause potential for circumferential diversions, leading to increased traffic at the Verrazzano-Narrows Bridge and the George Washington Bridge for through Manhattan CBD trips between Brooklyn, Queens, and Long Island and points in New Jersey or west.

Highway corridors and intersections determined to be potentially affected by CBD tolling were identified based upon modeling runs using the regional BPM for all tolling scenarios, consultation with NYCDOT and NYSDOT, and review of previous tolling studies.

Tolling Scenario D—with the highest crossing credits, exemptions, and discounts—was determined to be representative of the tolling scenarios with the highest potential for diversions and increases in traffic at certain Manhattan CBD crossings, Manhattan CBD highway approaches, intersections within and outside of the Manhattan CBD, and circumferential routes bypassing the Manhattan CBD. Therefore, detailed traffic analyses were performed for Tolling Scenario D. In a few cases, additional traffic analyses were performed for other tolling scenarios at specific locations where the projected increases in traffic volumes were higher.

[Table 4B-32 summarizes the potential traffic-related effects of the CBD Tolling Alternative, and Table 4B-33 summarizes how mitigation measures will be implemented by the Project Sponsors.]

HIGHWAY ANALYSIS

A total of 10 highway corridors were identified within the 28-county New York/New Jersey metropolitan area with a potential for increased traffic and adverse effects using the BPM to screen highways with

[34] Partnership for New York City. January 2018. *$100 Billion Cost of Traffic Congestion in Metro New York.* https://pfnyc.org/wp-content/uploads/2018/01/2018-01-Congestion-Pricing.pdf. The report defined the New York City region as New York, Kings, Queens, Bronx, Richmond, Nassau, Suffolk, Westchester, Putnam, and Rockland Counties, New York.

potential adverse effects for all tolling scenarios. These 10 highway corridors were analyzed using a Vissim microsimulation model, the HCS, or applying a speed and volume increase criteria where a traffic model and/or reliable pre-COVID19-pandemic traffic data were not available.

Although the overall effects of the CBD Tolling Alternative along highways used to access the Manhattan CBD would be beneficial for all tolling scenarios, potential adverse traffic effects along 3 of the 10 highway corridors analyzed were identified under some of the tolling scenarios during certain time periods as described below:

- Trans-Manhattan/Cross Bronx Expressway—westbound during the MD peak hour
- Long Island Expressway—westbound during the MD peak hour
- FDR Drive between East 10th Street and Brooklyn Bridge—northbound and southbound during the PM peak hour

Given the few locations where there is a potential for adverse traffic effects along highways leading to and from the Manhattan CBD and circumferential highways, the offsetting reductions in traffic volumes and improvements in travel times along routes from which traffic would divert, and the overall Project benefits in the Manhattan CBD and regionally due to a reduction in vehicular travel, the Project when viewed holistically would not have an adverse effect on traffic along the highway corridors used to access the Manhattan CBD and along circumferential routes.

Adverse effects ***[along highways]*** that would arise if Tolling Scenario D or another similar tolling scenario were implemented will be minimized through implementing Transportation Demand Management measures such as ramp metering, motorist information, signage, signal timing changes, and/or targeted toll policy modifications to reduce diversions. The Project Sponsors will undertake monitoring of traffic patterns specifically tailored to the adopted tolling scenario—commencing prior to implementation (to establish a baseline), with data collection approximately 3 months after the start of project operations—to determine whether the predicted adverse effects are occurring and to determine the appropriate Transportation Demand Management measures (or improvement in existing Transportation Demand Management measures) to be implemented. The monitoring program will examine changes in traffic volumes, changes in speeds, and changes in delays along the affected highway corridors. Volume changes will be determined from before/after traffic counts (where available); speed changes will be determined from actual before/after speeds based on data provided by StreetLight Data, Inc.; and the change in delay along major highway corridors will be determined based on actual speeds based on data provided by StreetLight Data, Inc. The monitoring program will inform the development and implementation of appropriate Transportation Demand Management measures and ***[subsequent]*** possible adjustments to the tolling policy should traffic volumes increase by more than 5 percent and delays increase ***[by]*** 2.5 minutes ***[or more]***.

INTERSECTION ANALYSIS

A total of 102 intersections were analyzed for the tolling scenarios with the largest increase in traffic applicable to each of the 15 study areas during the AM, MD, PM, and LN hours. These intersections were selected for analysis based on an evaluation of potential highway diversions as described above.

Most intersections would experience a decrease in traffic volumes and delays under all tolling scenarios. However, under the analyzed tolling scenarios, there would be increases in average delays at 4 of the 102 intersections analyzed that would exceed the greater-than-5-second threshold at LOS E/F used for determining adverse traffic effects under SEQRA. Signal-timing adjustments would reduce the projected increase in delays below the threshold or improve the LOS to D or better. Therefore, standard mitigation measures would avoid adverse traffic effects that could result from the CBD Tolling Alternative.

The robust post-implementation biennial Evaluation Report mandated by the Traffic Mobility Act will include traffic data collection at intersections in and around the Manhattan CBD and other locations of interest in the form of ATR and camera-based Vehicle Classification and Turning Movement Counts. These data will be used to identify and quantify actual traffic effects associated with the adopted tolling scenario. If any unforeseen adverse effects on traffic at local intersections are observed, appropriate signal timing mitigation measures will be developed and implemented consistent with NYCDOT policy.

Table 4B-32. Summary of Effects of the CBD Tolling Alternative on Highways and Local Intersections

TOPIC	SUMMARY OF EFFECTS	LOCATION	DATA SHOWN IN TABLE	TOLLING SCENARIO							POTENTIAL ADVERSE EFFECT	MITIGATION AND ENHANCEMENTS
				A	B	C	D	E	F	G		
Traffic – Highway Segments	The introduction of the CBD Tolling Program may produce increased congestion on highway segments approaching on circumferential roadways used to avoid Manhattan CBD tolls, resulting in increased delays and queues in midday and PM peak hours on certain segments in some tolling scenarios: • Westbound Long Island Expressway (I-495) near the Queens-Midtown Tunnel (midday) • Approaches to westbound George Washington Bridge on I-95 (midday) • Southbound and northbound FDR Drive between East 10th Street and Brooklyn Bridge (PM) • Other locations will see an associated decrease in congestion particularly on routes approaching the Manhattan CBD.	10 highway segments (AM)	Highway segments with increased delays and queues in peak hours that would result in adverse effects	0 out of 10 highway corridors in the analyzed tolling scenario (Tolling Scenario D)							Yes	Mitigation needed. The Project Sponsors will implement a monitoring plan prior to implementation with post-implementation data collected approximately three months after the start of [tolling] operations and including thresholds for effects; if the thresholds are reached or crossed, the Project Sponsors will implement Transportation Demand Management (TDM) measures, such as ramp metering, motorist information, signage at all identified highway locations with adverse effects upon implementation of the Project. [OT owns and maintains the relevant segments of the ong sland E pressway and The relevant segment of the rive is owned by OT south of Montgomery treet and C OT north of Montgomery treet mplementation of T M measures will be coordinated between the highway owners and the owners of any assets relevant to implementing the T M] Post-implementation [of T M measures], the Project Sponsors will monitor effects and, if needed, TBTA will modify the toll rates, crossing credits, exemptions, and/or discounts [within the parameters of the adopted toll schedule] to reduce adverse effects.
		10 highway segments (midday)		2 out of 10 highway corridors in the analyzed tolling scenario (Tolling Scenario D), as well as Tolling Scenarios E and F								
		10 highway segments (PM)		1 out of 10 highway corridors in the analyzed tolling scenario (Tolling Scenario D), as well as Tolling Scenarios E and F								
Intersections	Shifts in traffic patterns, with increases in traffic at some locations and decreases at other locations, would change conditions at some local intersections within and near the Manhattan CBD. Of the 102 intersections analyzed, most intersections would see reductions in delay.	363 locations (All day)	Number of instances of intersections with an increase in volumes of 50 or more vehicles in the peak hours.	9	10	24	50	48	50	10	Yes	Mitigation needed. [C OT] will monitor those intersections where [potential] adverse effects were identified and implement appropriate signal timing adjustments to mitigate the effect, per NYCDOT's normal practice. Enhancement Refer to the overall Project enhancement on monitoring at the end of this table.
		102 locations (AM)		2	2	3	3	3	3	2		
		102 locations (midday)		1	2	4	16	16	17	0		
		102 locations (PM)		1	1	1	10	9	9	1		
		57 locations (overnight)		5	5	16	21	20	21	5		
	Potential adverse effects on four local intersections in Manhattan: Trinity Place and Edgar Street (midday); East 36th Street and Second Avenue (midday); East 37th Street and Third Avenue (midday); East 125th Street and Second Avenue (AM, PM)	4 locations	Locations with potential adverse effects that [will] be addressed with signal timing adjustments	0	0	0	4	4	4	0		

OVERALL PROJECT ENHANCEMENT. The Project Sponsors commit to ongoing monitoring and reporting of potential effects of the Project, including for example, traffic entering the Manhattan CBD, taxi/FHV vehicle-miles traveled in the Manhattan CBD; transit ridership from providers across the region; bus speeds within the Manhattan CBD; air quality and emissions trends; parking; and Project revenue. Data will be collected in advance and after implementation of the Project. A formal report on the effects of the Project will be issued one year after implementation and then every two years. In addition, a reporting website will make data, analysis, and visualizations available in open data format to the greatest extent [practicable]. Updates will be provided on at least a bi-annual basis as data becomes available and analysis is completed.

[Table 4B-33. Summary of the CBD Tolling Alternative Implementation Approach for Mitigation and Enhancement Measures for Highways and Local Intersections]

TOPIC	RELEVANT LOCATION(S)	DESCRIPTION OF MITIGATION OR ENHANCEMENT	TIMELINE FOR PRE- AND POST-PROJECT IMPLEMENTATION DATA COLLECTION FOR SPECIFIC MEASURES	THRESHOLD FOR DETERMINING WHEN NEXT STEP(S) WILL BE IMPLEMENTED	TIMING FOR SPECIFIC MEASURES	LEAD AGENCY
Traffic – Highway Segments	Three highway segments: • Westbound Long Island Expressway (I-495) near the Queens-Midtown Tunnel (midday) • Approaches to westbound George Washington Bridge on I-95 (midday) • Southbound and northbound FDR Drive between East 10th Street and Brooklyn Bridge (PM)	The Project Sponsors will implement a monitoring plan prior to implementation with post-implementation data collected approximately three months after the start of tolling operations and including thresholds for effects; if the thresholds are reached or crossed, the Project Sponsors will implement Transportation Demand Management (TDM) measures, such as ramp metering, motorist information, signage at all identified highway locations with adverse effects upon implementation of the Project. NYSDOT owns and maintains the relevant segments of the Long Island Expressway and I-95. The relevant segment of the FDR is owned by NYSDOT south of Montgomery Street and NYCDOT north of Montgomery Street. Implementation of TDM measures will be coordinated between the highway owners and the owners of any assets relevant to implementing the TDM. Post-implementation of TDM measures, the Project Sponsors will monitor effects and, if needed, TBTA will modify the toll rates, crossing credits, exemptions, and/or discounts within the parameters of the adopted toll schedule to reduce adverse effects.	Exact timing for data collection will be based on seasonality and other factors such as construction activity in accordance with NYCDOT's traffic count best practices. Modeling to quantify delay will be completed within 60 days of data collection. Baseline data will be collected within the six months prior to Project implementation. Post-implementation data will be collected approximately three months after the start of tolling operations. If TDM measures are implemented, additional data will be collected within six months after their implementation to determine whether they have addressed the adverse effect.	An increase in average weekday peak period delay of 2.5 minutes or more. The methods of data collection and evaluation will follow standard practices pursuant to guidelines of NYSDOT Highway Design Manual 5.2 and NYSDOT Data Services procedures.	The monitoring plan will be agreed to by the relevant lead and partnering agencies prior to a decision document being issued. TDM measures will be implemented over a period of two to eighteen months after confirming delays in excess of the threshold for next steps. More readily implementable measures (e.g., variable message signs) will be completed first. NYSDOT currently has two TDM projects progressing on the relevant segments of the LIE and the Cross Bronx (I-95) and TDM measures could be coordinated with these projects, as needed. Modifications to toll rates, crossing credits, exemptions, and/or discounts will be made after confirming delays in excess of the threshold for next steps persist following implementation of TDM measures, to allow for analysis of what the modifications should be and public outreach about any changes.	NYSDOT will lead in partnership with TBTA and NYCDOT.
Intersections	Four local intersections in Manhattan: • Trinity Place and Edgar Street (midday) • East 36th Street and Second Avenue (midday) • East 37th Street and Third Avenue (midday) • East 125th Street and Second Avenue (AM, PM)	NYCDOT will monitor those intersections where potential adverse effects were identified and implement appropriate signal timing adjustments to mitigate the effect, per NYCDOT's normal practice.	Exact timing for data collection will be based on seasonality and other factors such as construction activity in accordance with NYCDOT's traffic count best practices. Modeling to quantify delay will be completed within 60 days of data collection. Baseline data will be collected within the six months prior to Project implementation. Post-implementation data will be collected within the six months after Project implementation.	For intersections at LOS E or F pre-implementation, an increase in average intersection delay of greater than five seconds. For intersections at LOS D or better pre-implementation, an increase of intersection delay of greater than five seconds and a worsening of LOS to E or F.	Signal timing adjustments will be made within 90 days of confirming delays in excess of the threshold for next steps.	NYCDOT will lead in partnership with TBTA.
Overall Project Enhancement	Manhattan CBD and other locations in the 28-county region	The Project Sponsors commit to ongoing monitoring and reporting of potential effects on the Project, including for example, traffic entering the CBD, vehicle-miles traveled in the CBD; transit ridership from providers across the region; bus speeds within the CBD; air quality and emissions trends; parking; and Project revenue. Data will be collected in advance and after implementation of the Project. A formal report on the effects of the Project will be issued one year after implementation and then every two years. In addition, a reporting website will make data, analysis, and visualizations available in open data format to the greatest extent practical. Updates will be provided on at least a bi-annual basis as data becomes available and analysis is completed.	Baseline data gathering began in 2019 and will continue through Project implementation as data from external sources becomes available (with some data sets published only annually or quarterly) and data analysis is completed. After Project implementation, these data sets will continue to be collected as they become available and new data sets, such as Project revenue, will start being collected.	N/A – No threshold required; implemented under any adopted tolling structure.	The reporting website will begin reporting baseline data and post-implementation data from the tolling system as soon as practical after Project implementation. A formal report on the effects of the Project will be issued one year after implementation and then every two years. In addition, the reporting website will make data, analysis, and visualizations available in open data format to the greatest extent practical. Updates will be provided on at least a bi-annual basis as data becomes available and analysis is completed.	TBTA will lead in partnership with NYCDOT, NYSDOT, with coordination with other agencies and entities for data as appropriate.

4C. Transit

This subchapter describes the effects of implementing the CBD Tolling Alternative on transit. Analyses of potential effects on traffic conditions, parking, pedestrians, and bicycle usage are presented in other subchapters of **Chapter 4, "Transportation."** A summary of the affected environment and No Action Alternative conditions and assessment of the environmental consequences of the Project based on the incremental changes in transit ridership between the No Action Alternative and CBD Tolling Alternative is provided below.

4C.1 INTRODUCTION

New York City is home to 8.4 million residents and 4.6 million jobs.[1, 2] The Manhattan CBD is a destination for millions of daily trips and as established in **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling,"** the vast majority of these trips are made by public transportation. The high-density economic center of Manhattan is connected to the region by transit with a range of modes and service providers, all of which transport millions of workers, residents, and visitors daily to and from the Manhattan CBD. These transit services include local and express subways, commuter and intercity rail, local and express buses, Select Bus Service, intercity buses, ferries, an aerial tramway at Roosevelt Island, and paratransit. **Table 4C-1** lists the 10 busiest subway stations, and **Table 4C-2** lists the 10 busiest lines by ridership entering the Manhattan CBD. (**Figure 4C-1** highlights MTA's service within New York City, and **Section 4C.3** provides an overview of regional transit service and operators.)

Transit is the primary mode of travel to the Manhattan CBD; therefore, the continued investment in transit is critical to mobility and accessibility of the Manhattan CBD and the region.[3] Existing funding sources are insufficient to pay for the transit improvement and modernization projects identified in the MTA 2020-2024 Capital Program and subsequent capital programs that are needed for subway, bus, and commuter rail services. The New York State Legislature adopted the MTA Reform and Traffic Mobility Act to provide stable and reliable funding to repair and revitalize the transit system.

To assess the transit system for potential adverse effects as a result of the Project, future conditions with the No Action Alternative and CBD Tolling Alternative were projected using the Best Practice Model (BPM), a regional travel demand model developed and managed by the New York Metropolitan Transportation Council (NYMTC). As described in more detail in **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling,"** the BPM provides regional transportation demand (including transit ridership) for the AM peak period defined as between 6:00 a.m. and 10:00 a.m. The modeled change or increment between the No Action Alternative and the CBD Tolling Alternative for projected inbound trips toward the Manhattan CBD provide the primary basis for the analysis presented in this subchapter. **Section 4C.4.2.2** presents a summary of effects across all tolling scenarios and a determination of the representative tolling

1 U.S. Census Bureau. American Community Survey, 2015-2019.
2 U.S. Census Bureau, 2012–2016 Census Transportation Planning Package.
3 **Chapter 1, "Introduction,"** provides additional context on the importance of transit to the Manhattan CBD and the region and the need for transit funding, which the Project provides.

scenario with the highest incremental increases in ridership. **Section 4C.2** presents a description of the methodologies used for the assessment of potential adverse effects.

Table 4C-1. Busiest Subway Stations (Annual Total Ridership, 2019)

RAN	STATION/COMPLEX	LINES SERVED	RIDERSHIP
1	Times Sq/42 St/PABT	N, Q, R, W, S; Nos. 1, 2, 3, 7; A, C, E	65,020,294
2	Grand Central – 42 St	S; Nos. 4, 5, 6, 7	45,745,700
3	34 St – Herald Sq	B, D, F, M, N, Q, R, W	39,385,436
4	14 St – Union Sq	L, N, Q, R, W; Nos. 4, 5, 6	32,385,260
5	Fulton St	A, C, J, Z; Nos. 2, 3, 4, 5	27,715,365
6	34 St – Penn Station	Nos. 1, 2, 3	25,967,676
7	34 St – Penn Station	A, C, E	25,631,364
8	59 St – Columbus Circle	A, B, C, D; No. 1	23,040,650
9	Chambers St, WTC/Park Pl/Cortlandt	A, C, E; Nos. 2, 3; R, W	20,820,549
10	Lexington Av-53 St/51 St	E, M; No. 6	18,957,465

Source: MTA

Note: Data is from 2019, the last full year since the onset of the COVID-19 pandemic. Station ridership is the annual total ridership for 2019; PABT = Port Authority Bus Terminal.

Table 4C-2. Busiest Subway Lines at the Entrance to the Manhattan CBD (2019, AM Peak Period)

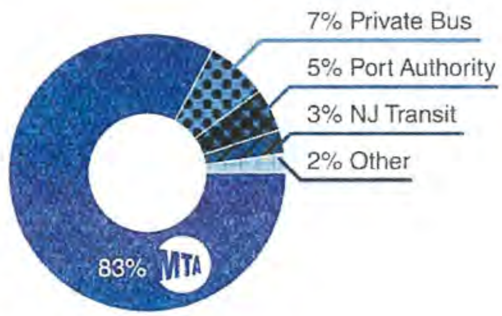
RAN	SUBWAY LINE	RIDERSHIP	NO. PEA -PERIOD SUBWAY TRAINS
1	B, D, N, Q Local	119,435	162
2	Broadway/Seventh Av Express	89,330	125
3	E/M (Queens)	87,258	139
4	Eighth Av Express	84,317	130
5	No. 7 (Queens)	81,066	176
6	N, Q, R (Queens)	67,047	78
7	L	66,760	62
8	Lexington Av Express	63,486	80
9	A, C Local	62,937	65
10	F	48,069	86

Source: WSP, Best Practice Model 2021

Note: Data is from 2019, the last full year since the onset of the COVID-19 pandemic. Ten busiest subway lines are listed based on cordon ridership total per subway line in the AM peak period (6:00 a.m. to 10:00 a.m.).

Figure 4C-1. New York City Transit System Highlights

Transit Trips Entering Manhattan CBD
by operator



Source: NYMTC Hub Bound Travel Data Report, 2019

MTA and its subsidiaries and affiliates provide the bulk of transit trips in the region. They comprise **25** subway lines, over **300** bus routes, and **14** commuter rail routes/branches.

1.7 Billion Annual Ridership

5.5 Million Average Weekday Subway Ridership

2.2 Million Average Weekday Bus Ridership

6,600+ Subway Cars

472 Stations serving 25 subway lines

24/7 Service

Source: MTA, 2019

While the BPM provides a regionwide basis to estimate demand by all modes of travel over time and from changes to the transportation network, **Section 4C.3** describes existing transit service as documented in NYMTC's *Hub Bound Travel Data Report 2019*, which is the most comprehensive and route-specific data source to describe travel to the Manhattan CBD. Like the BPM used for this EA, the *Hub Bound Travel Data Report 2019* baseline was developed prior to the COVID-19 pandemic, so it represents a reasonable estimate of the No Action Alternative in 2023 as travel demand returns to pre-COVID-19 pandemic levels. However, because the *Hub Bound Travel Data Report 2019* is not directly comparable to the BPM results for the No Action Alternative, this subchapter's analyses of potential effects are based on the BPM results for the Action Alternative compared with BPM results for the No Action Alternative.

Section 4C.4 assesses the incremental change between the No Action Alternative and the CBD Tolling Alternative in 2023.[4] The BPM results for the No Action Alternative were used as the baseline for this analysis because they reflect transit ridership prior to the COVID-19 pandemic that is now beginning to rebuild but is anticipated to remain below the levels modeled in the BPM.

4C.1.1 Traveling To and Within the Manhattan CBD

Nearly 3.9 million commuters enter the Manhattan CBD each day, across a variety of modes including numerous transit operators that are described in **Section 4C.3**.[4] With a long development history that predates the automobile, a multitude of transit options are available. Transit accounts for 75.8 percent of daily trips into the Manhattan CBD (not including walk or bike trips); subway alone accounts for 58 percent of trips.[5] Except for one census tract in Breezy Point, Queens, every other census tract in New York City is within a half mile of at least one transit service. The transit system serving the region and the Manhattan CBD is described in detail in Chapter 4, Section 4.2 (Transit Access to the Manhattan CBD), and it includes subways (MTA), Port Authority Trans-Hudson (PATH), commuter rail, buses, ferries, and tram.

For travel within the Manhattan CBD, there are numerous options other than private automobiles. Indeed, 80 percent of Manhattan CBD residents do not own or have ready access to a vehicle.[6] As noted above, numerous subway and bus routes serve the Manhattan CBD. There is a network of bicycle lanes and a widely available bike-share program, and the Manhattan CBD is very walkable.

Most businesses do not offer on-site, free parking, and curbside parking is limited. Driving from place to place within the Manhattan CBD is not typical except for commercial deliveries. Taxis and for-hire vehicles (FHVs, a category that includes app-based services) provide point-to-point service within the Manhattan CBD and are convenient for trips that would otherwise involve multiple transit routes and modes or a long walk (i.e., crosstown trips between the east and west sides of Manhattan). However, even short taxi or FHVs trips may be costly. Therefore, many people make their longer local trips within the

4 The BPM's long-range 2045 analysis year assessment includes MTA Capital Program projects and projects programmed in the NYMTC Transportation Improvement Program. In light of the scale of those projects relative to line-haul capacity and station configurations, detailed analysis is not provided for the 2045 analysis year. Instead, an overview of incremental change (systemwide boardings) at the 2045 horizon year is provided.

5 New York Metropolitan Transportation Council, *Hub Bound Travel Data Report 2019.*

6 This data is from the CTPP data product based on the 2012–2016 ACS. The CTPP provides custom tables describing residence, workplace, and trips from home to work. The U.S. Census Bureau has not updated the CTPP to reflect more recent American Community Survey data.

Manhattan CBD by subway or bus, and many others travel by bicycle. Walking is the typical choice for shorter trips or even longer trips that involve multiple transit modes or transfers.

4C.2 METHODOLOGY AND ASSUMPTIONS

Information presented in the NYMTC *Hub Bound Travel Data Report 2019*, which summarizes weekday trips entering and exiting the Manhattan CBD by all modes, was used to describe the affected environment. Data for that report was collected in fall 2019 and include full-day and hourly trips. This year is assessed as the final full year before the onset of the COVID-19 pandemic.[7]

The analysis presented compares the forecast difference (or "incremental change") in transit ridership that would occur between the CBD Tolling Alternative and the No Action Alternative. Information on projected ridership for the No Action Alternative and CBD Tolling Alternative was based on the results of the regional transportation modeling conducted for the Project using the BPM.[8] **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling,"** provides more information on the modeling process and corresponding model results. The analysis in this subchapter considers effects on transit line-haul capacity, which is the capacity of a transit mode at its peak ridership point, and on specific transit stations. These assessments are consistent with the methodologies outlined in the *City Environmental Quality Review (CEQR) Technical Manual*. The *CEQR Technical Manual* recommends a tiered approach in evaluating a project's effects on transit ridership.

4C.2.1 Application of the New York City Environmental Quality Review for Assessment of Transit Effects

New York City agencies use the CEQR process to determine what effect, if any, a discretionary action they approve may have on the environment. The first version of the *CEQR Technical Manual* was published in 1993 and has undergone numerous updates over the years, with the latest edition released at the end of 2021. The *CEQR Technical Manual* discusses methodologies that may be used to analyze specific impact categories. The methodologies have been developed by the expert staffs of various city agencies, working with consultants. CEQR is New York City's process for implementing New York State's Environmental Quality Review Act. It considers the unique characteristics of New York City and establishes evaluation criteria that are suitable for assessing environmental effects in New York City. Most New York City-based NEPA reviews use the available state and local guidance appropriate to evaluate the potential for adverse effects. Since SEQRA has no impact determination criteria for transit, the guidance provided in the *CEQR Technical Manual* provides a means of appropriately examining and disclosing these effects in a dense urban setting.

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7 The study of transportation conditions for purposes of environmental review is normally conducted using stabilized baselines of typical ridership and usage conditions. Although normalcy is slowly being restored, COVID-19 effects on the regional transit system still persist and are expected to remain for some time, likely well into 2024, after the planned implementation of the Project (based on McKinsey analysis for MTA). As such, only the pre-COVID-19 environment can now be considered a valid baseline for study. MTA 2021 Budget and 2021–2024 Financial Plan Adoption Materials. MTA Finance Committee/MTA Board. December 16, 2020. https://new.mta.info/document/25291.

8 BPM assumes public transit fares remain consistent with consumer price index. Due to the importance of transit in the region, ridership is relatively inelastic to fare increases. MTA historical data show real fares (adjusted for inflation) have decreased over time.

4C.2.1.1 USE OF CEQR THRESHOLDS TO TARGET TRANSIT ANALYSES

Based on operating experience from various New York City agencies and the results of extensive numbers of impact assessments conducted on transit facilities, CEQR guidance establishes assessment thresholds whereby detailed analyses are recommended for locations or transit lines where incremental trip generation thresholds are exceeded; if the applicable threshold is not exceeded, no adverse effects are anticipated. The methodologies stipulated in the 2020 *CEQR Technical Manual* are described below.

The methodologies to evaluate line-haul capacity include the following:

- For subways and commuter rail:
  - An increase in ridership on a single subway line that is fewer than 200 new passengers at the maximum load point in the peak hour in a single direction of travel does not have the potential to result in adverse effects.
  - A quantitative analysis of effects on line-haul capacity was performed for any transit services for which the BPM results indicated that the CBD Tolling Alternative would add more new passengers than those thresholds.
  - The next step is to evaluate the number of incremental passengers per train and per train car.
  - If a line remains under its guideline capacity in the future with the CBD Tolling Alternative implemented, the corresponding CBD Tolling Alternative-induced ridership increases would not be considered an adverse effect.
  - If a line is forecasted to operate above guideline capacity and the CBD Tolling Alternative is expected to yield five or more incremental passengers per car, then the ridership increase would constitute an adverse effect.
- For buses:
  - An increase in ridership that is fewer than 50 passengers per hour in a single direction of travel for a bus route does not have the potential to result in adverse effects because such an increase would not be considered perceptible with the level of bus service provided.
  - If the threshold is exceeded, the next step is to evaluate the number of incremental passengers per trip and the volume-to-capacity (v/c) ratio for that bus route.
  - A v/c ratio under 1.00 would not be considered an adverse effect.

The methodologies to evaluate capacity of stations include the following:

- An increase in ridership at a subway station or station complex that is fewer than 200 new passengers in the peak hour does not have the potential to result in adverse effects.
- If a project would result in the addition of 200 or more new passengers at a station in the peak hour (excluding cross-platform transfers), then further analyses could be warranted to assess the potential for adverse effects on station elements such as stairs, escalators, fare collection areas, etc.
- If a station would experience an increase of fewer than 200 peak-hour passengers, further analysis is typically not warranted.

Due to operating characteristics similar to the subway, including hours of operation, headways, boardings, standing capacity, and for consistency, PATH capacity and stations were both evaluated using CEQR criteria. In coordination with Metro-North Railroad (Metro-North) and the LIRR, CEQR methodologies were used to assess ridership of commuter rail lines and stations. This analysis recognizes that five additional passengers within a train car in its most crowded point would be noticeable. Similarly, analyses of stations for the New Jersey Transit Corporation (NJ TRANSIT) and PATH were performed using CEQR guidelines for consistency and because NJ TRANSIT and the Port Authority of New York and New Jersey (PANYNJ) do not have an alternative guideline. The CEQR analysis guidelines were also evaluated for NJ TRANSIT and other suburban buses that enter the Manhattan CBD.

The line haul and station analysis primarily considers the AM peak period based on concentration of ridership. For station element analyses, potential effects in the PM peak hour were also considered to account for differences in circulation and flow within the stations. The BPM only provides forecast trip increments for the four-hour AM peak period, the incremental AM and PM peak-hour trips were estimated, in coordination with New York City Transit (NYCT), by applying reasonable factors to the BPM results.

For any station exceeding the 200-passenger increment threshold, an additional assessment of station characteristics was undertaken to determine if a qualitative assessment would suffice to conclude that the CBD Tolling Alternative would not have potential adverse effects or if more quantitative analyses were warranted. **Appendix 4C-5, "Transportation: Supporting Documentation for Transit Analyses"** provides more details on the qualitative and quantitative analysis of transit stations, which were developed in consultation with NYCT.

4C.3 AFFECTED ENVIRONMENT

4C.3.1 Regional Transit Environment

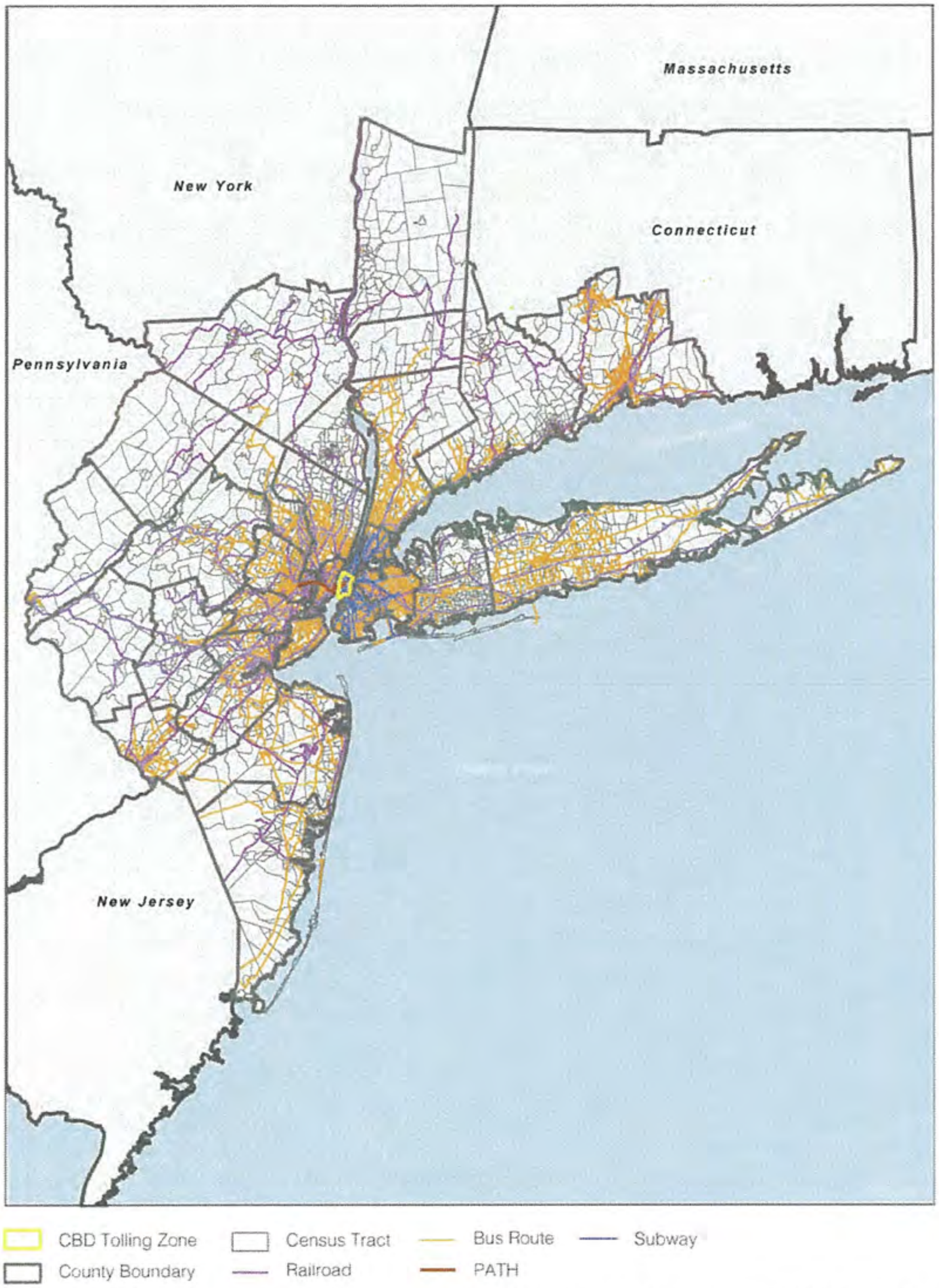
The 28-county study area is rich with transit service (**Figure 4C-2**). While **Section 4C.3.2** focuses on transit options to and from the Manhattan CBD, additional transit options exist throughout the study area. The following is an overview of the regional transit environment.

4C.3.1.1 CONNECTICUT

Much of Connecticut's commuter rail network in Fairfield and New Haven Counties is focused on hub-bound travel; however, the reverse-commute market from New York City to Fairfield County is significant, along with intrastate travel throughout the Metro-North New Haven Line. Branch lines to New Canaan, Danbury, and Waterbury provide additional connections along with the CTrail Hartford Line from New Haven to Hartford.

Local bus services are provided by several operators within (and between) Fairfield and New Haven Counties in Connecticut. Numerous routes connect communities within Connecticut, with concentrations of service in urban areas such as Stamford, Norwalk, Bridgeport, New Haven, and Waterbury. Bus markets between these communities are often distinct from rail markets, particularly where rail branch line services are less frequent or less favorable to intrastate travel.

Figure 4C-2. Transit Services in the 28-County Regional Study Area



Sources: Environmental Services Research Institute (ESRI) 2020, NYC Open Data, MTA, NYSDOT 2021, NJ Geographic Information Network Open Data, NJ TRANSIT 2021, Westchester County, CT Transit 2021.

Note*[s]*:

[1.] Map reflects publicly available datasets only. Additional transit services are available in Nassau, Rockland, and other counties.

[2. For an audio description, please go to the following link: https://www.youtube.com/watch?v=3laoEmd0a6w&list=PLZHkn788ZQJPEY5zv-dr2gzkzMQFMgb_2&index=1.]

4C.3.1.2 NEW JERSEY

Commuter rail services in northern New Jersey largely focus on New York-bound travel; however, intrastate ridership is significant and serves a variety of urban areas and activity centers including Newark, Hoboken, Trenton, and Metropark, among others. The NJ TRANSIT rail network is heavily integrated with local and regional bus networks, light rail, PATH, and ferries, supporting reverse-commute activity from New York City as well.

Local and regional bus service is prevalent throughout northern New Jersey with concentrations in major urban areas such as Hudson County and New Jersey's largest cities, including Newark, Paterson, Jersey City, and Elizabeth. NJ TRANSIT operates most local bus service, complemented by some contract and private carrier routes, along with county and municipal operations, including paratransit, senior, and human services transportation. Private jitney services are also prevalent in Hudson, Bergen, and Passaic Counties, serving both local and interstate customers.

4C.3.1.3 NEW YORK

Commuter rail in Nassau, Suffolk, Rockland, Orange, Dutchess, Putnam, and Westchester Counties is largely focused on travel to New York City. Each east-of-Hudson line is used for intercounty and intracounty travel and for reverse-commute travel from New York City to major employment centers such as White Plains and Stamford, Connecticut.

Extensive local bus networks exist in New York counties adjacent to New York City, notably the Bee-Line and Nassau Inter-County Express (NICE) bus networks in Westchester and Nassau Counties, respectively. Bus transit is also prevalent throughout the region in counties such as Suffolk, Dutchess, Putnam, Orange, and Rockland.

Bee-Line bus service focuses on the suburban and urban portions of southern Westchester County, with hubs in White Plains, Yonkers, Mount Vernon, and New Rochelle. Bee-Line routes connect a wide array of communities and offer multimodal connections to commuter rail, subway, and regional bus services.

Nassau County buses connect communities and activity centers with hubs including (but not limited to) Hempstead, Great Neck, Mineola, and Hicksville. Many hubs include intermodal connections at commuter rail stations, while some routes also serve the Jamaica hub in Queens. Connections are also available to Suffolk County buses in Hicksville. Other New York county bus systems are smaller in scale but offer similar functionality.

While many routes provide multimodal connections at commuter rail stations (and some subway stations), a significant focus of these networks is intracounty travel. Each bus system offers opportunities to transfer to New York City-bound transit or travel within the counties between activity and population centers.

4C.3.1.4 NEW YORK CITY

As previously stated, a multitude of transit options exist within New York City, though the New York City subway is the primary commute option. There are almost three times as many subway riders as bus riders according to pre-COVID-19 pandemic data (approximately 5.5 million average weekday subway riders versus 2.2 million average weekday bus riders).

As the most convenient and affordable means of travel for most New Yorkers, commuters are unlikely to change modes if the subway or station they regularly use is crowded periodically. They may need to wait for the next train, which is typically 5 to 15 minutes away. Moreover, the availability of express and local services throughout the system provides duplicity of service along lines into the Manhattan CBD such that additional capacity is available, especially during peak periods.

4C.3.2 Summary of Transit Service by Provider

4C.3.2.1 DESCRIPTION OF TRANSIT OPERATORS AND SERVICES

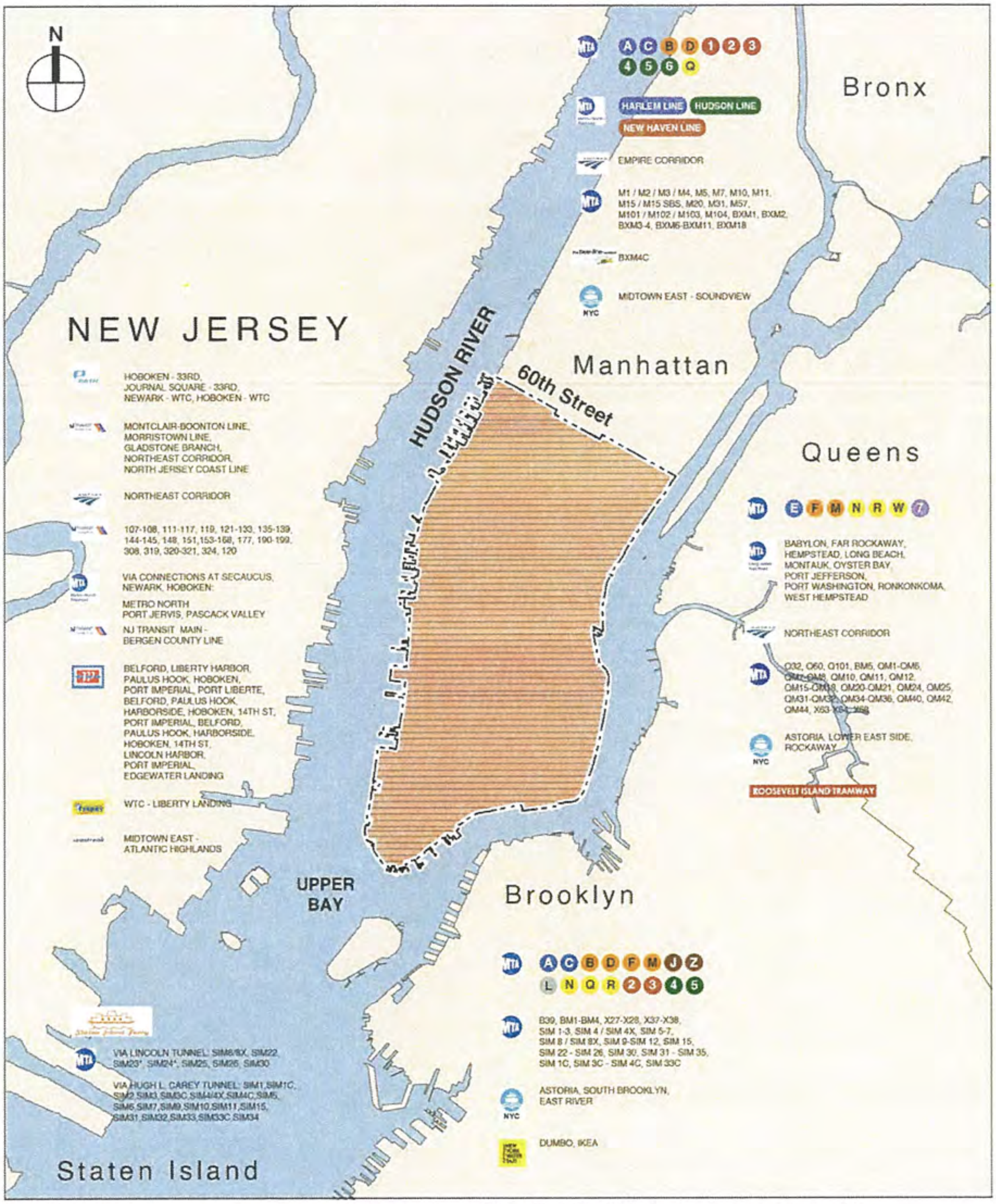
The transit modes and services available to the Manhattan CBD are illustrated on **Figure 4C-3**. The transit system serving the region and the Manhattan CBD is described in detail in Chapter 4, Section 4.2 (Transit Access to the Manhattan CBD), and it includes subways (MTA), PATH, commuter rail, buses, ferries, and tram.

Each of the operators highlighted within **Figure 4C-3** is listed or described below. Consistent with *Hub Bound Travel Data Report 2019* data, which serve as the basis for existing conditions, the following service level estimates reference 2019 data to reflect pre-COVID-19 pandemic conditions:

- **MTA:** MTA and its subsidiaries and affiliates—LIRR, Metro-North, NYCT, and MTA Bus—provide the bulk of transit trips to the Manhattan CBD. The New York City subway system is the single largest transit provider.
  - **MTA subway.** The New York City subway is the most widely used transit mode for access to the Manhattan CBD by residents of New York City.[9] There are 25 individual subway routes that cross into the Manhattan CBD, carrying about 1.35 million AM peak-period riders in and out of the Manhattan CBD on a typical weekday.

[9] The subway does not provide access to the Manhattan CBD from Staten Island. The Staten Island Railway (**Figure 4C-3**) provides rapid-transit within the island.

Figure 4C-3. Transit Routes to/from the Manhattan CBD (2019)



Notes: Private bus operators connect commuters to various locations within the Manhattan CBD; those routes are not displayed here.
* Operated by Academy Bus

Manhattan CBD (Excluding West Side Highway/Route 9A and FDR Drive)

Transit by Sector

Source: NYMTC *Hub Bound Travel Data Report 2019*

- **MTA buses.** NYCT and MTA Bus[10] operate an array of local and express buses and Select Bus Service within New York City (Bus maps for each borough are available in **Appendix 4C-1** and at https://new.mta.info/maps). NYCT operates 234 local, 73 express, and 20 Select Bus Service routes, while MTA Bus operates another 90 express, 44 local, and 3 Select Bus Service routes. From the public's perspective, the two operators are nearly indistinguishable. Therefore, this subchapter refers to the combined services as "MTA buses." MTA buses provide local services into and out of the Manhattan CBD largely at 60th Street as well as local and express bus services from outer boroughs. Local service across the 60th Street boundary consists predominantly of Manhattan-based local services running north/south, serving the Upper East Side, Upper West Side, Harlem, Washington Heights, and Inwood. Local services are also provided to and from Queens via the Ed Koch Queensboro Bridge and to and from Brooklyn via the Williamsburg Bridge. Express bus routes connect the Manhattan CBD with the Bronx, Brooklyn, Queens, and Staten Island. These express bus routes tend to serve areas with fewer or no direct subway connections to the Manhattan CBD. MTA buses carry about 42,245 passengers across the boundary of the Manhattan CBD during the AM peak period on a typical weekday.[11]

- **MTA commuter rail**:
  - LIRR runs commuter rail services to Long Island with service to and from Penn Station New York and service to Atlantic Terminal in Brooklyn, as well as Jamaica, Hunters Point Avenue, and Long Island City in Queens, where passengers can connect with subways or ferries to Manhattan. (The East Side Access project brings LIRR service into Grand Central Terminal, ***[and opened in December]*** 2022). LIRR serves 124 stations across its 11 branches: Montauk, Port Jefferson, Ronkonkoma, Babylon, West Hempstead, Long Beach, Hempstead, Oyster Bay, Far Rockaway, Port Washington, and the Main Line. These branches include 10 stops within the City Terminal Zone (1 in Manhattan at Penn Station New York; 3 in Brooklyn; 6 in Queens[12]). On a typical weekday, more than 89,000 riders cross into the Manhattan CBD via LIRR during the AM peak period. (The LIRR system map is available in **Appendix 4C-1**).
  - Metro-North provides commuter rail service for Westchester, Putnam, and Dutchess Counties in New York State (east of Hudson), Rockland and Orange Counties in New York State (west of Hudson) and Fairfield and New Haven Counties in Connecticut. Three east-of-Hudson lines terminate at Grand Central Terminal: the Hudson, Harlem, and New Haven lines. (The Penn Station Access project will connect Penn Station New York with the New Haven line, among other improvements. It is expected to take 63 months to complete). These three lines on a typical weekday carry about 85,000 passengers across the Manhattan CBD during the AM peak period.
  - NJ TRANSIT operates west-of-Hudson services (Port Jervis and Pascack Valley Lines) under contract to and from Hoboken Terminal in New Jersey and are considered part of the New Jersey sector for this analysis. West-of-Hudson travel to Penn Station New York is possible via

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10 The Manhattan and Bronx Surface Transit Operating Authority, as a subsidiary of NYCT, is also included in these numbers.

11 Because data was collected in 2019, ongoing MTA NYCT bus network redesign projects for each borough have not been incorporated into the affected environment description.

12 Mets-Willets Point Station in Queens operates only for special-event service.

a transfer to NJ TRANSIT rail in Secaucus, New Jersey.[13] (The Metro-North system map is provided in **Appendix 4C-1**).

- **PANYNJ:** PANYNJ operates commuter rail transit service between New York City and New Jersey via the PATH trains (service map available in **Appendix 4C-1**).[14] The routes originate from Hoboken, Jersey City, and Newark with New York City terminals at the World Trade Center and West 33rd Street. PATH service in Manhattan includes one train stop in Lower Manhattan and four stops between Greenwich Village and Midtown. PATH service has an AM peak-period ridership of about 100,000 passengers on a typical weekday. PATH ridership into the Manhattan CBD also includes NJ TRANSIT, Newark Light Rail, and Hudson-Bergen Light Rail customers who transfer to PATH in Newark, Jersey City, and Hoboken.

  PANYNJ also owns and operates the PABT at West 42nd Street and Eighth Avenue, as well as the George Washington Bridge Bus Station (GWBBS) at Broadway between West 178th and West 179th Streets, but it does not operate any of the bus services to and from these locations. Many New Jersey bus passengers transfer at the GWBBS to the New York City subway system to travel to the Manhattan CBD.

- **NJ TRANSIT:** NJ TRANSIT operates commuter rail and bus services into and out of the Manhattan CBD. Five NJ TRANSIT rail lines provide direct service to Penn Station New York. (The other NJ TRANSIT rail lines provide transfers to Penn Station New York at Newark and Secaucus, New Jersey, or to other destinations in the Manhattan CBD via PATH or ferries from Hoboken, New Jersey.) The NJ TRANSIT commuter rail system map is available in **Appendix 4C-1**.

  Numerous NJ TRANSIT bus routes serve Manhattan via the Lincoln Tunnel to the PABT. NJ TRANSIT also runs one bus route to Lower Manhattan via the Holland Tunnel. Some NJ TRANSIT bus routes serve the GWBBS in Upper Manhattan, where most passengers transfer to the A subway line (or No. 1 subway line several blocks away) to reach the Manhattan CBD. On a typical weekday, NJ TRANSIT commuter rail serves about 68,133 passengers while its bus operations carry about 148,364 passengers during the AM peak period.

  NJ TRANSIT also owns and operates the Hudson-Bergen Light Rail, which connects the communities of Bayonne, Jersey City, Hoboken, Weehawken, Union City, and North Bergen, Newark Light Rail, and the River Line, connecting Trenton and Camden, New Jersey. Hudson-Bergen Light Rail provides a transfer point to NJ TRANSIT rail, bus, PATH, and ferry services at Hoboken.

- **Private Bus Operators**: Various private bus operators serve the PABT GWBBS, and on-street locations in the Manhattan CBD from origins in New Jersey, southern New York (west of the Hudson River), and eastern Pennsylvania. Private jitney buses operate from Hudson, Bergen, and Passaic Counties in New Jersey to the Manhattan CBD at the PABT and on-street around the bus terminal. Hampton Jitney operates daily bus service between eastern Long Island, New York and the Manhattan CBD as well as Upper Manhattan, using on-street stops in the Manhattan CBD. Additional long-distance bus operators such as Megabus, Peter Pan Bus, and Greyhound[15] also commission routes serving these corridors. Of

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13 Metro-North west-of-Hudson transfers constitute a small percentage of all west-of-Hudson transit trips routes.

14 Although PATH is Federally classified as a commuter rail system, based on headways, stations, and boardings, and consistent with the NYMTC *Hub Bound Travel Data Report 2019*, it has been categorized as a subway system for this analysis.

15 Greyhound also operates a commuter service to New York from a park-and-ride facility in southern New Jersey.

the private operators that participated in the 2015 PABT/GWBBS Continuous Bus Survey, 40 percent provided commuter service (defined through measures of distance and bus frequency), and all private operators collectively provided 27 percent—about 20,000 passengers—of AM peak-hour inbound PABT trips on a typical weekday.[16]

- **Amtrak:** Amtrak provides intercity rail service between Penn Station New York and destinations nationwide.[17] Amtrak's Northeast Corridor directly links Penn Station New York with Boston to the north, Washington, D.C., to the south, and key cities in between. The Empire Corridor links New York City with Albany and points west toward Buffalo, with the bulk of service provided between New York City and Albany. While Amtrak primarily serves long-distance travelers, some commuters also use these services as an alternative to commuter rail services provided by Metro-North or NJ TRANSIT. On a typical weekday, AM peak-period ridership on Amtrak in and out of Penn Station New York is about 6,700 passengers.
- **NICE**: NICE bus is the local bus system serving Nassau County and connecting passengers with western Suffolk County and Queens. It serves 48 MTA LIRR stations and 5 MTA NYCT subway stations that provide connectivity to the Manhattan CBD. (There is no NICE service directly to the Manhattan CBD.) Notable transfer points include but are not limited to Jamaica Center, 179th Street-Flushing, Far Rockaway (to MTA buses); Flushing, Jamaica, Far Rockaway (to NYCT subways); and Mineola Intermodal Transfer Center, Hicksville, Freeport, and Great Neck (to LIRR commuter rail). Prior to the COVID-19 pandemic, daily ridership of NICE service exceeded 100,000.[18]
- **Westchester County Department of Transportation/Bee-Line**: Westchester County's Bee-Line bus system operates a weekday-only direct express bus service from several suburban communities to the Manhattan CBD via 11 round trips each weekday, serving about 160 passengers in the AM peak period on a typical weekday. Bee-Line also provides connecting local bus services to NYCT subway service in the Bronx.
- **NYCDOT Staten Island Ferry:** NYCDOT provides free ferry service between Lower Manhattan and Staten Island via the Staten Island Ferry, with AM peak-period ridership of 19,866 inbound and outbound passengers on a typical weekday.
- **NYC Ferry:** The New York City Economic Development Corporation operates several NYC Ferry routes, which were originally introduced in 2017. As of 2019, these routes provide service between Manhattan, the Bronx, Brooklyn, and Queens. Expansion of this service in 2021 included a new route between Staten Island, Battery Park City, and Midtown at West 39th Street. A new route is planned between Wall Street/Pier 11 and Coney Island in Brooklyn, along with other route extensions and new stops. As

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16 2015 PABT/GWBBS Continuous Bus Survey, which was prepared for the PANYNJ by VHB.

17 Amtrak is categorized as suburban rail (here, commuter rail) in the NYMTC *Hub Bound Travel Data Report 2019* and is therefore described under **Section 4C.2**. Because these travelers are such a small proportion of Manhattan CBD commuters, they are not noted within **Section 4C.3**.

18 LongIsland.com. 2019. "Nassau Inter-County Express (NICE)." https://www.longisland.com/business/nassau-inter-county-express-nice.html.

of fall 2019,[19] average daily ridership during peak months across all NYC Ferry routes (inbound and outbound) was about 23,000 passengers.[20]

- **Other Private Ferry Services:** Other ferry operators provide service to and from the Manhattan CBD. With the exception of New York Water Taxi, all providers offer routes between Manhattan and New Jersey. The New York Water Taxi operates around Lower Manhattan and Brooklyn. New York Water Taxi destinations include the South Street Seaport, Battery Park, and Midtown Manhattan, along with the DUMBO neighborhood in Brooklyn.

  Other operators include New York Waterway, Seastreak, and Liberty Landing Ferry. New York Water Taxi operates mostly as a tour operation, except for the IKEA route to and from Brooklyn. The New York Waterway ferry alone provides service to about 32,000 passengers on a typical weekday (inbound and outbound).[21]

- **Roosevelt Island Tramway:** The Roosevelt Island Tramway serves as a direct connection between Roosevelt Island and the rest of Manhattan via an aerial tram directly to the north of the Ed Koch Queensboro Bridge. (Access between Roosevelt Island and the Manhattan CBD is also provided by a stop on the F subway line, and the Roosevelt Island stop on the East River ferry line.) The tramway carries 859 passengers in the AM peak period into the Manhattan CBD on a typical weekday.

4C.3.2.2 RIDERSHIP DISTRIBUTION

Table 4C-3 presents the NYMTC *Hub Bound Travel Data Report 2019* daily weekday ridership[22] estimates by key transit service providers to the Manhattan CBD, as well as total trips by service provider.

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19 2019 data for comparison to NYMTC *Hub Bound Travel Data Report 2019* of the same year.

20 New York City Economic Development Corporation. 2018. *NYC Ferry Quarterly Update 7/1/17 - 9/30/17*. September 17. https://images.ferry.nyc/wp-content/uploads/2018/09/13143041/NYC-Ferry-2017-Q3-Quarterly-Update.pdf. NYC Ferry data is collected and published quarterly; this report includes ridership statistics from July through September 2019.

21 AMNY. 2019. "Coast Guard suspends New York Waterway ferries over safety issues." https://www.amny.com/transportation/coast-guard-suspends-ny-waterway-ferries-over-safety-issues/.

22 NYMTC *Hub Bound Travel Data Report 2019* presents person-trips into the Manhattan CBD, which is equivalent to the ridership at that location; the BPM similarly measures passenger load at a location unless otherwise noted.

Table 4C-3. Transit Ridership to and from the Manhattan CBD by Service Provider (AM Peak Period) (2019)

SERVICE PROVIDER	INBOUND PERSON-TRIPS		TOTAL PERSON-TRIPS[3]	
	Number of Trips	Percentage of Trips	Number of Trips	Percentage of Trips
Subway				
New York City Transit	962,665	91.9%	1,257,761	92.6%
Port Authority Trans-Hudson (PATH)	84,317	8.1%	100,515	7.4%
TOTAL	1,046,982	100.0	1,358,276	100.0
Commuter and Intercity Rail				
Long Island Rail Road	84,580	37.2%	89,500	35.8%
Metro-North Railroad	79,154	34.8%	85,582	34.2%
West of Hudson/NJ TRANSIT	60,295	26.5%	68,133	27.3%
Amtrak[2]	3,361	1.5%	6,711	2.7%
TOTAL	227,390	100.0	249,926	100.0
Buses				
New Jersey[1]	116,186	76.0%	148,364	77.8%
New York City Transit/MTA Bus	36,501	23.9%	42,245	22.1%
Westchester County DOT/Bee-Line	160	0.1%	160	0.0%
TOTAL	152,847	100.0	190,769	100.0
Ferries/Tramway[4]				
Staten Island Ferry	16,881	49.2	20,028	51.1
Roosevelt Island Tramway/Other Ferry	17,430	50.8	19,143	48.9
TOTAL	34,311	100.0	39,171	100.0

Source: NYMTC *Hub Bound Travel Data Report 2019*.

1 New Jersey bus trips include NJ TRANSIT, MTA buses via Staten Island, and private carriers.

2 Amtrak is classified under "commuter rail" for existing conditions data, consistent with the *Hub Bound Travel Data Report 2019* classification.

3 Total includes inbound and outbound person-trips.

4 The *Hub Bound Travel Data Report 2019* does not present operator data for ferry/tramway. All ferry trips from Staten Island can be assumed to be via Staten Island Ferry because this was the only transit service operating to the Manhattan CBD from Staten Island in 2019. The ferry number presented above contains cyclists aboard the ferry.

4C.3.3 Transit Ridership Overview

As summarized in **Table 4C-4**, approximately 75.2 percent of the more than 7 million daily person-trips into and out of the Manhattan CBD are made using transit (because transit accessibility is critical for low income commuters, **Chapter 17, "Environmental Justice,"** provides an additional detailed assessment of transit ridership by income).[23] Based on the *Hub Bound Travel Data Report 2019*, the majority of these transit trips (57.5 percent of all trips into and out of the Manhattan CBD) are by subway. Commuter rail also serves a substantial proportion of trips made to the Manhattan CBD, followed by bus service. The proportion of transit trips is highest during the AM peak period, when 83.3 percent of trips are made via transit (**Table 4C-5**), which is why the analyses in this subchapter were conducted for the AM peak period. The AM peak period has the highest concentration of person- and vehicle-trips under baseline conditions and is typically used for assessing the effects of large-scale regional transportation projects.

In total, MTA bus services account for approximately 1.6 percent of all trips into and out of the Manhattan CBD. NJ TRANSIT bus service carries about 5.3 percent of all trips. Other private bus carriers (such as Greyhound, Coach USA, Academy, DeCamp, and Lakeland) with service to the PABT and on-street in Manhattan account for less than 1 percent of all trips into and out of the Manhattan CBD. The remaining 1.7 percent of Manhattan CBD transit trips are by ferry service (provided primarily by the Staten Island Ferry along with NYC Ferry, and private ferry companies) and the Roosevelt Island Tramway.

Table 4C-4. Daily Person-Trips by Mode to and from the Manhattan CBD on an Average Weekday (2019)

MODE	NUMBER OF PERSON-TRIPS	PERCENTAGE OF TOTAL
Transit		
Subway	4,398,284	57.5%
Commuter and Intercity Rail	685,330	9.0%
Buses	532,307	7.0%
Ferries	126,425	1.7%
Tramway	5,516	0.1%
Su total	5,747,862	75.2%
Non-Transit		
Auto/Taxi/Truck/Van	1,835,842	24.0%
Bicycle	65,588	0.8%
TOTAL	7,649,292	100.0

Source: NYMTC *Hub Bound Travel Data Report 2019.*
Note: Data includes inbound and outbound trips. Staten Island Ferry person-trips include onboard bicyclists.

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[23] For purposes of describing the share of Manhattan CBD-bound trips that are made using transit, bicycle and pedestrian trips were not included. On an average weekday about 67,000 bicycle trips (less than 1 percent) enter the Manhattan CBD daily (per the *Hub Bound Travel Data Report 2019*). Pedestrian trips are not included in the *Hub Bound Travel Data Report 2019*.

Table 4C-5. AM Peak-Period Person-Trips to and from the Manhattan CBD by Mode on an Average Weekday (2019)

MODE	NUMBER OF PERSON-TRIPS	PERCENTAGE OF TOTAL
Transit		
Subway	1,358,276	61.6%
Commuter and Intercity Rail	249,926	11.3%
Buses	190,769	8.7%
Ferries	38,084	1.7%
Tramway	1,087	0.1%
Su total	1,838,142	83.3%
Non-Transit		
Auto/Taxi/Truck/Van	356,022	16.1%
Bicycle	12,862	0.6%
TOTAL	2,207,026	100.0

Source: NYMTC *Hub Bound Travel Data Report 2019.*
Note: Data includes inbound and outbound trips. Staten Island Ferry person-trips do include count of onboard bicycles.

4C.3.4 Existing Volumes Entering the Manhattan CBD (2019)

This section briefly describes existing (2019) transit ridership for trips into and out of the Manhattan CBD from the five geographic sectors that the *NYMTC Hub Bound Travel Data Report* uses to organize trips. These are defined according to entry and exit from the Manhattan CBD: Manhattan north of 60th Street, Queens, Brooklyn, Staten Island, and New Jersey/west of Hudson.[24] **Figure 4C-4** shows the distribution and mode of all transit crossings (in relation to the total trips).

As shown on **Figure 4C-4** and **Figure 4C-5**, the Manhattan – 60th Street sector carries the most total trips as well as the second-most transit trips of the five sectors. Even so, with 83 percent of trips from this sector made by transit, the Manhattan/60th Street sector has a lower proportion of its total trips made by transit than Queens (89 percent), New Jersey (90 percent), and Brooklyn (87 percent).[25]

[24] The boundary of the Manhattan CBD according to the *Hub Bound Travel Data Report* consists of 60th Street (including at the Franklin D. Roosevelt [FDR] Drive and West Side Highway/Route 9A), the East and Hudson Rivers, and New York Harbor. This boundary generally matches the boundaries defined for the Manhattan CBD, except that the Manhattan CBD does not include the FDR Drive and the West Side Highway/Route 9A.

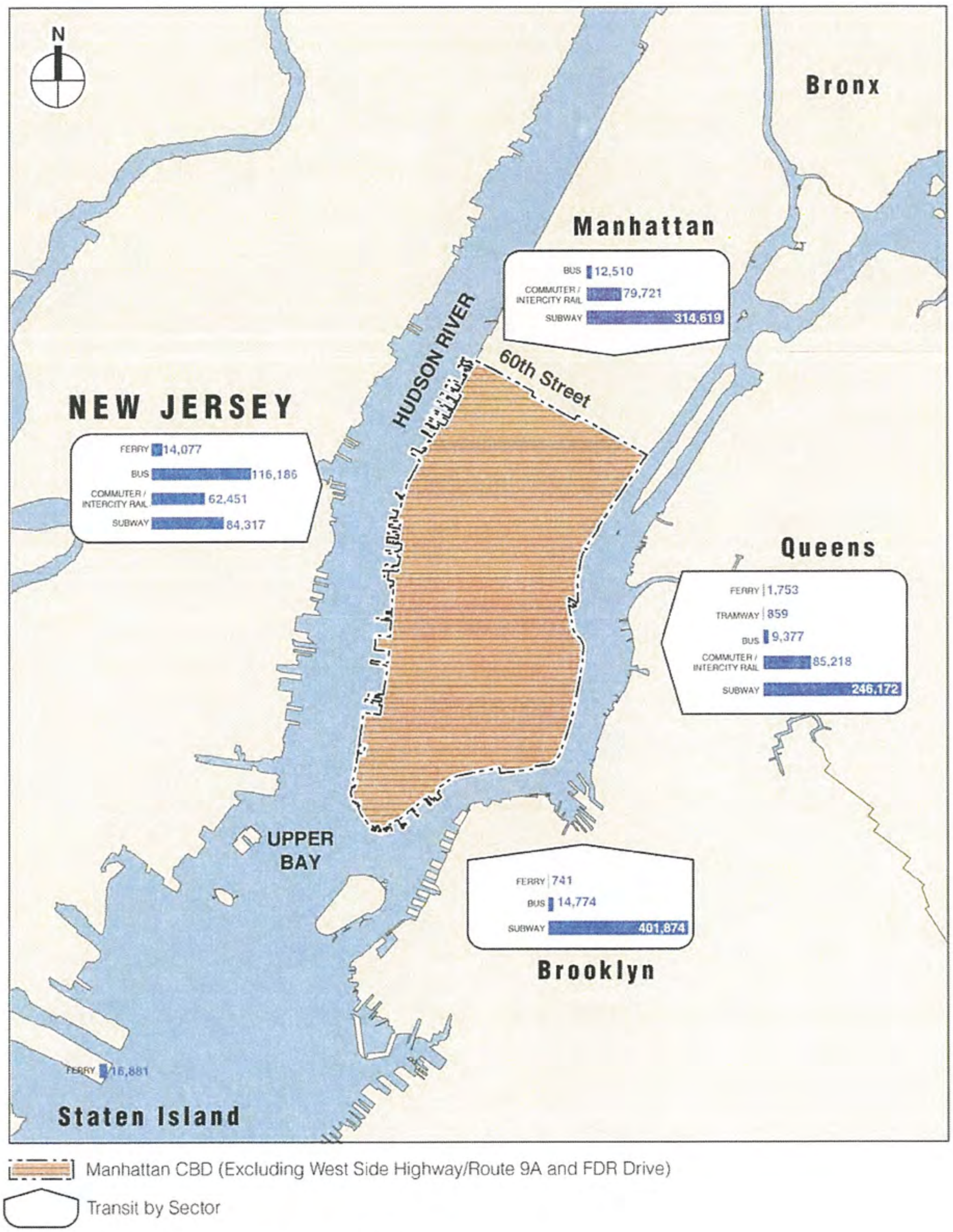
[25] While the Ed Koch Queensboro Bridge ramps were considered as within the 60th Street sector (for autos/trucks/taxi trips), bus trips over the bridge as analyzed in this subchapter were considered within the Queens sector. Similarly, the F subway line entering from Roosevelt Island/Queens was categorized as coming from the Queens sector, although the subway tunnel actually crosses the 60th Street cordon line.

Figure 4C-4. Inbound AM Peak-Period Trips by Sector

Source: NYMTC *Hub Bound Travel Data Report 2019*.

Note: The *Hub Bound Travel Data Report 2019* does not provide vehicle data for Staten Island because vehicles arrive to the Manhattan CBD via Brooklyn or New Jersey; similarly Staten Island trips on express buses that run through New Jersey and Brooklyn without stopping there, as well as bus-to-subway transfers in Brooklyn, are counted in those sectors. Therefore the only direct trips shown for this table are transit trips via Staten Island ferry.

Figure 4C-5. Transit Modes into the Manhattan CBD by Volume at the Cordon Crossing (AM Peak Period)



Source: NYMTC *Hub Bound Travel Data Report 2019.*

The Staten Island sector has the smallest number of total trips. (The actual proportion of transit riders from this sector is lower since the *Hub Bound Travel Data Report* does not provide vehicle data for Staten Island because vehicles arrive to the Manhattan CBD via Brooklyn or New Jersey.) Staten Island trips on express buses that run through New Jersey and Brooklyn without stopping there, as well as bus-to-subway transfers in Brooklyn, are counted in those sectors.[26] Therefore, the only direct trips between Staten Island and the Manhattan CBD are via the ferry.

Appendix 4C-3 describes AM peak period ridership for each sector in greater detail.

4C.4 ENVIRONMENTAL CONSEQUENCES

4C.4.1 No Action Alternative

The evaluation of environmental consequences in this subchapter compares the CBD Tolling Alternative to the No Action Alternative in 2023. Because the *Hub Bound Travel Data Report 2019* used to describe the affected environment in **Section 4C.3** is not directly comparable to the BPM results for 2023 for the No Action Alternative, this subchapter does not provide a discussion of the change in conditions between the affected environment discussed earlier and the No Action Alternative. The No Action Alternative conditions modeled from the BPM are compared to the CBD Tolling Alternative below.

BPM results were used to identify anticipated transit usage for the No Action Alternative in 2023 and 2045. The 2045 model includes background growth based on the projected overall growth in employment and population in the region and is consistent with the NYMTC 2045 Long Range Plan. More background on regional transportation effects is provided in **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling."** For the No Action Alternative, the transit system within and outside of the Manhattan CBD would be comparable to current availability and utility of the transit system.

4C.4.2 CBD Tolling Alternative

As set forth in **Section 4C.4.2.2**, all tolling scenarios would generate an increase in transit ridership compared to the No Action Alternative. The representative tolling scenarios with the highest incremental ridership increases are used to assess potential adverse effects in the following two areas:

- Line-Haul Assessment – The projected change in ridership at the maximum load point for each transit service is assessed for the CBD Tolling Alternative's effects on line-haul capacity (the capacity of a transit mode at its peak ridership point) for any increases that pass the screening threshold for detailed analysis, as discussed in **Section 4C.2**. The assessment is conducted for transit services by the delineated sector crossings into the Manhattan CBD as established in **Section 4C.4**.
- Station Assessment – A station-level assessment is provided for any transit station (including subway, PATH, or commuter rail) that exceeds CEQR thresholds of increased ridership of more than 200 passengers in a peak hour, also as discussed in **Section 4C.2**.

[26] The average weekday ridership of Staten Island express bus routes was 32,909 in 2019 (the same year as the *Hub Bound Travel Data Report 2019*), which is close to the total number of daily riders on the Staten Island Ferry. MTA data is available at http://web.mta.info/nyct/facts/ridership/ridership_bus.htm.

4C.4.2.1 CHANGE IN RIDERSHIP BY MODE AND OPERATOR

Table 4C-6 summarizes projected future ridership by all transit modes in 2023—for the No Action Alternative and CBD Tolling Alternative (Tolling Scenarios A through G) for the AM peak period—based on the results of the BPM.

While most of the analysis in this subchapter covers the year 2023, **Table 4C-8** provides information for the horizon year 2045 in a format parallel to **Table 4C-6** to show the longer-term projected level of environmental consequences based on BPM results.

All tolling scenarios would result in an increase in overall transit ridership of between 1.25 percent (Tolling Scenario A) and 1.77 percent (Tolling Scenario E) compared to the No Action Alternative for the entire regional study area. The rate of change across the tolling scenarios varies by about 33,000 trips, with the lowest projected increase occurring under Tolling Scenario A and the highest under Tolling Scenario E. This indicates that higher toll rates (Tolling Scenarios D, E, and F) would result in a higher shift to transit than lower toll rates (Tolling Scenarios A, B, and G). Tolling Scenario C reflects a middle area with higher tolls and more crossing credits than Tolling Scenarios A, B, and G, but lower tolls and fewer crossing credits than Tolling Scenarios D, E, and F. A table provides a percentage change summary for all the major transit elements evaluated in this subchapter including New York City subways that carry the majority of regional transit riders as well as commuter railroads, buses, ferries, and other transit services. A slightly higher increment is projected for Metro-North and ferry ridership under Tolling Scenario F. By 2045, transit ridership as a whole is projected to increase by several hundred thousand boardings (given assumptions in the NYMTC regional model).[27]

4C.4.2.2 COMPARISON ACROSS TOLLING SCENARIOS

Representative Tolling Scenario

The assessment identifies the representative tolling scenario with the highest incremental increase in ridership for specific transit elements. These transit elements are primarily drawn from Tolling Scenarios D, E, and F because these tolling scenarios are projected to experience the largest increases in transit ridership. (Tolling Scenario C has been identified as the representative case with the highest incremental increase in ridership for Newark Penn Station for both PATH and NJ TRANSIT.)

Analysis of Transit Lines and Transit Stations

Transit lines and transit stations were each analyzed using the representative tolling scenario with the highest incremental ridership increase to determine the maximum level of potential effects. For transit lines, the potential effects were measured by how train or bus loading (i.e., line-haul) conditions are expected to change. For transit stations, the potential effects were measured by the anticipated usage changes at fare control areas (FCA) (i.e., turnstiles and gates separating free and fare zones) and vertical circulation elements (VCE) (i.e., stairs and escalators).

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[27] These increases are due to the NYMTC socioeconomic forecasts for the 28-county region. Most NJ TRANSIT rail boardings and alightings are in New Jersey at stations including Newark Penn Station, Secaucus Junction, and Hoboken Terminal. This results in only about 2,000 new alightings at Penn Station New York.

Table 4C-6. Transit Ridership: No Action Alternative and CBD Tolling Alternative (2023 AM Peak Period)

MODE	NO ACTION ALTERNATIVE	TOLLING SCENARIO A	TOLLING SCENARIO B	TOLLING SCENARIO C	TOLLING SCENARIO D	TOLLING SCENARIO E	TOLLING SCENARIO F	TOLLING SCENARIO G
Subway	3,138,960	3,184,961	3,187,374	3,192,428	3,199,370	3,203,052	3,199,783	3,197,389
New York City Transit	3,005,224	3,050,101	3,052,683	3,056,840	3,063,552	3,066,614	3,063,577	3,061,455
Port Authority Trans-Hudson (PATH)	133,736	134,860	134,691	135,588	135,818	136,438	136,206	135,934
Commuter and Intercity Rail	454,520	456,755	457,863	459,632	461,634	463,108	462,013	458,867
Long Island Rail Road	142,651	143,452	143,989	144,244	144,733	145,544	144,560	144,084
Metro-North Railroad	152,203	153,128	153,437	154,108	154,850	154,296	155,020	153,491
NJ TRANSIT	159,666	160,175	160,437	161,280	162,051	163,268	162,433	161,292
Buses	2,689,564	2,718,960	2,717,506	2,724,787	2,724,456	2,727,512	2,726,657	2,718,457
MTA buses	2,037,319	2,063,136	2,062,997	2,068,001	2,067,753	2,069,107	2,068,898	2,062,926
NJ TRANSIT	471,109	474,344	473,456	474,079	474,279	476,321	475,663	474,260
Other	181,136	181,480	181,053	182,707	182,424	182,084	182,096	181,271
Other Transit	58,635	60,073	60,225	60,467	60,474	60,475	60,712	60,246
Ferries	57,548	58,966	59,120	59,358	59,363	59,360	59,598	59,140
Tramway	1,087	1,107	1,105	1,109	1,111	1,115	1,114	1,106
TOTAL	6,341,679	6,420,749	6,422,968	6,437,314	6,445,934	6,454,147	6,449,165	6,434,959

Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019.*

Note: Data total over a 4-hour period, defined as total boardings, which include transfers. (Because this ridership estimate includes transfers, the ridership reported is greater than MTA NYCT MetroCard data that is widely available.) The BPM includes MTA buses, NJ TRANSIT buses, smaller regional bus carriers, and private carriers. (Other smaller carriers and private carriers are included under "Other Buses.") Tramway volumes were calculated using an incremental change factor derived from Queens/Roosevelt Island sector change per each tolling scenario.

Table 4C-7. Percentage Change in Transit Ridership: No Action Alternative and CBD Tolling Alternative (2023 AM Peak Period)

MODE	TOLLING SCENARIO A	TOLLING SCENARIO B	TOLLING SCENARIO C	TOLLING SCENARIO D	TOLLING SCENARIO E	TOLLING SCENARIO F	TOLLING SCENARIO G
Subway	1.5	1.5	1.7	1.9	2.0	1.9	1.8
New York City Transit	1.5%	1.6%	1.7%	1.9%	2.0%	1.9%	1.8%
Port Authority Trans-Hudson (PATH)	0.8%	0.7%	1.4%	1.6%	2.0%	1.8%	1.6%
Commuter and Intercity Rail	0.5	0.7	1.1	1.6	1.9	1.6	1.0
Long Island Rail Road	0.6%	0.9%	1.1%	1.5%	2.0%	1.3%	1.0%
Metro-North Railroad	0.6%	0.8%	1.3%	1.7%	1.4%	1.9%	0.8%
NJ TRANSIT	0.3%	0.5%	1.0%	1.5%	2.3%	1.7%	1.0%
Buses	1.1	1.0	1.3	1.3	1.4	1.4	1.1
MTA buses	1.3%	1.3%	1.5%	1.5%	1.6%	1.6%	1.2%
NJ TRANSIT	0.7%	0.5%	0.6%	0.7%	1.1%	1.0%	0.7%
Other	0.2%	0.0%	0.9%	0.7%	0.5%	0.5%	0.1%
Other Transit	2.5	2.7	3.1	3.1	3.1	3.5	2.7
Ferries	2.5%	2.7%	3.1%	3.2%	3.1%	3.6%	2.7%
Tramway	1.8%	1.7%	2.0%	2.2%	2.6%	2.5%	1.7%
TOTAL	1.2	1.3	1.5	1.6	1.8	1.7	1.5

Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019* (Tramway), and analysis by FHI Studio.

Note: Data total over a 4-hour period, defined as percentage change in total systemwide boardings. The BPM includes MTA buses, NJ TRANSIT buses, other smaller regional bus carriers, and private carriers. (Other smaller carriers and private carriers are included under "Other Buses.") Tramway volumes were calculated using the average growth over a five-year period with an incremental change factor derived from Queens/Roosevelt Island sector change per each tolling scenario.

Table 4C-8. Transit Ridership: No Action Alternative and CBD Tolling Alternative (2045 AM Peak Period)

MODE	NO ACTION ALTERNATIVE	TOLLING SCENARIO A	TOLLING SCENARIO B	TOLLING SCENARIO C	TOLLING SCENARIO D	TOLLING SCENARIO E	TOLLING SCENARIO F	TOLLING SCENARIO G
Subway	3,505,040	3,556,434	3,552,926	3,559,460	3,569,286	3,576,311	3,572,538	3,557,745
New York City Transit	3,344,746	3,394,538	3,390,882	3,397,112	3,406,542	3,413,503	3,409,708	3,395,715
Port Authority Trans-Hudson (PATH)	160,294	161,896	162,044	162,348	162,744	162,808	162,830	162,030
Commuter and Intercity Rail	566,908	571,260	571,648	572,767	575,243	575,760	575,845	571,840
Long Island Rail Road	182,379	183,350	183,968	183,855	184,739	184,062	184,856	183,867
Metro-North Railroad	206,505	208,301	208,346	208,583	209,623	210,064	210,407	208,441
NJ TRANSIT	178,024	179,609	179,334	180,329	180,881	181,634	180,582	179,532
Buses	2,958,354	2,990,051	2,985,086	2,991,552	2,997,750	2,998,714	2,997,420	2,988,399
MTA buses	2,182,751	2,209,043	2,206,110	2,211,296	2,215,888	2,217,583	2,214,448	2,210,288
NJ TRANSIT	562,497	567,619	566,723	567,631	567,841	568,634	569,748	566,447
Other	213,106	213,389	212,253	212,625	214,021	212,497	213,224	211,664
Other Transit	59,817	61,265	61,172	61,428	61,770	61,960	61,625	60,941
Ferries	58,663	60,097	60,006	60,256	60,594	60,780	60,444	59,775
Tramway	1,154	1,168	1,166	1,172	1,176	1,180	1,181	1,166
TOTAL	7,090,119	7,179,010	7,170,832	7,185,207	7,204,049	7,212,745	7,207,428	7,178,925

Source: WSP; Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019.*

Note: Data total over a 4-hour period, defined as total boardings, which include transfers. (Because this ridership estimate includes transfers, the ridership reported is greater than MTA NYCT MetroCard data that is widely available.) The BPM includes MTA buses, NJ TRANSIT buses, smaller regional bus carriers, and private carriers. (Other smaller carriers and private carriers are included under "Other Buses.") Tramway volumes were calculated using an incremental change factor derived from Queens/Roosevelt Island sector change per each tolling scenario.

Analysis primarily considered AM peak ridership based on concentration of ridership. For station element analyses, potential effects in the PM peak hour were also considered to account for differences in circulation and flow within the stations.

The overall effects by tolling scenario are summarized below, along with the identification of the representative tolling scenario with the highest incremental increase in ridership used in the detailed assessment of environmental consequences (see **Section 4C.4**).*[28]*

For assessing capacity of *transit lines* (line haul), incremental shifts to transit were analyzed based on the representative tolling scenario with the highest incremental ridership at the tolling boundary. **Table 4C-9** shows the number of lines exceeding the threshold for triggering detailed analysis, across all tolling scenarios. Tolling Scenarios D, E, and F are projected to have the largest number of lines with ridership increases over 200 passengers,[29] with the highest increases among lines over the threshold under Tolling Scenarios E and F.

Table 4C-10 and Table 4C-11 show that of the seven modeled tolling scenarios, Tolling Scenario E is projected to have the largest number of stations exceeding thresholds in both the AM and PM peak hours, with a slightly lower number of stations exceeding thresholds under Tolling Scenarios A, D, F, and G. Because Tolling Scenario E projected the highest transit system ridership, it was selected as the tolling scenario for detailed analysis of stations requiring further analysis (except at one location in Newark, New Jersey—for both PATH and NJ TRANSIT—where Tolling Scenario C was selected for its greater station ridership increase). The incremental ridership at stations in the selected tolling scenario (Tolling Scenario E) is comparable to the increments in Tolling Scenarios D and F, and, therefore, representative of those tolling scenarios as well; the incremental increase in ridership in Tolling Scenarios A, B, C, and G are predominantly lower than in Tolling Scenarios D, E, and F.

4C.4.2.3 CHANGE IN RIDERSHIP AND EVALUATION OF LINE-HAUL CAPACITY BY SECTOR

This section assesses the incremental change in ridership (at the boundary of the Manhattan CBD), followed by maximum load point for each sector using the methodologies described in **Section 4C.2**. **Table 4C-9** summarizes the increases across all sectors. Each row of the incremental change tables provided for each of the sectors crossing into the Manhattan CBD represents a particular link to the Manhattan CBD (such as buses entering via the Hugh L. Carey Tunnel, crossing the Brooklyn cordon) and provides the passenger load for the No Action Alternative and CBD Tolling Alternative, as well as the highest incremental change projected for the particular transit line on the representative tolling scenario predicted to result in the largest incremental increase in passenger demand. This series of sector tables presents AM peak period, inbound-only trips crossing the cordon line.

[28 For the Final EA, the Project Sponsors committed to additional mitigation measures (see Chapter 16, "Summary of Effects," Table 16-2). These new mitigation commitments neither require a change in the tolling scenarios used for the analyses in the EA nor change the fundamental conclusions of the EA (see Chapter 3, "Environmental Assessment Framework," Section 3.3.3).]

29 CEQR identifies a threshold of 200 incremental riders per line as recommending further detailed analysis of line haul capacity (described further in **Section** 4C.2.1.1).

Table 4C-9. Transit Lines Triggering Detailed Line-Haul Analysis and Average Incremental Ridership Increase Across Tolling Scenarios (AM Peak Hour)

TOLLING SCENARIO	PORT AUTHORITY TRANS-HUDSON (PATH)		NEW YORK CITY TRANSIT SUBWAY		COMMUTER RAIL		BUS		TOTAL
	Number of Lines Exceeding Threshold	Average Incremental Ridership Increase	Number of Lines Exceeding Threshold	Average Incremental Ridership Increase	Number of Lines Exceeding Threshold	Average Incremental Ridership Increase	Number of Lines Exceeding Threshold	Average Incremental Ridership Increase	Number of Lines Exceeding Threshold
A	0	—	1	290	0	—	0	—	1
B	0	—	1	231	2	296	0	—	3
C	0	—	3	244	1	376	0	—	4
D	0	—	5	248	3	315	0	—	8
E	1	234	5	265	4	282	0	—	10
F	0	—	7	249	3	326	0	—	10
G	1	242	1	235	1	232	0	—	3

Source: WSP, Best Practice Model 2021.
Note: Average incremental ridership increase is the average increase in passengers among stations with hourly passenger increments over the 200 passenger threshold. Following CEQR guidance, subway and commuter rail lines with a projected net hourly increase of 200 or more passengers trigger detailed line-haul analysis. Bus lines with a projected net hourly increase of 50 or more passengers also trigger detailed line-haul analysis.

Table 4C-10. Transit Stations Triggering Detailed Analysis and Average Incremental Ridership Increase Across Tolling Scenarios (AM Peak Hour)

TOLLING SCENARIO	PORT AUTHORITY TRANS-HUDSON (PATH)		NEW YORK CITY TRANSIT SUBWAY		COMMUTER RAIL		TOTAL
	Number of Stations Exceeding Threshold	Average Incremental Ridership Increase	Number of Stations Exceeding Threshold	Average Incremental Ridership Increase	Number of Stations Exceeding Threshold	Average Incremental Ridership Increase	Number of Stations Exceeding Threshold
A	0	—	15	307	2	201	19
B	0	—	15	319	3	412	18
C	1	240	15	340	4	440	19
D	2	223	16	380	3	532	20
E	2	290	18	382	3	621	23
F	2	268	16	386	4	539	22
G	1	266	13	325	4	267	18

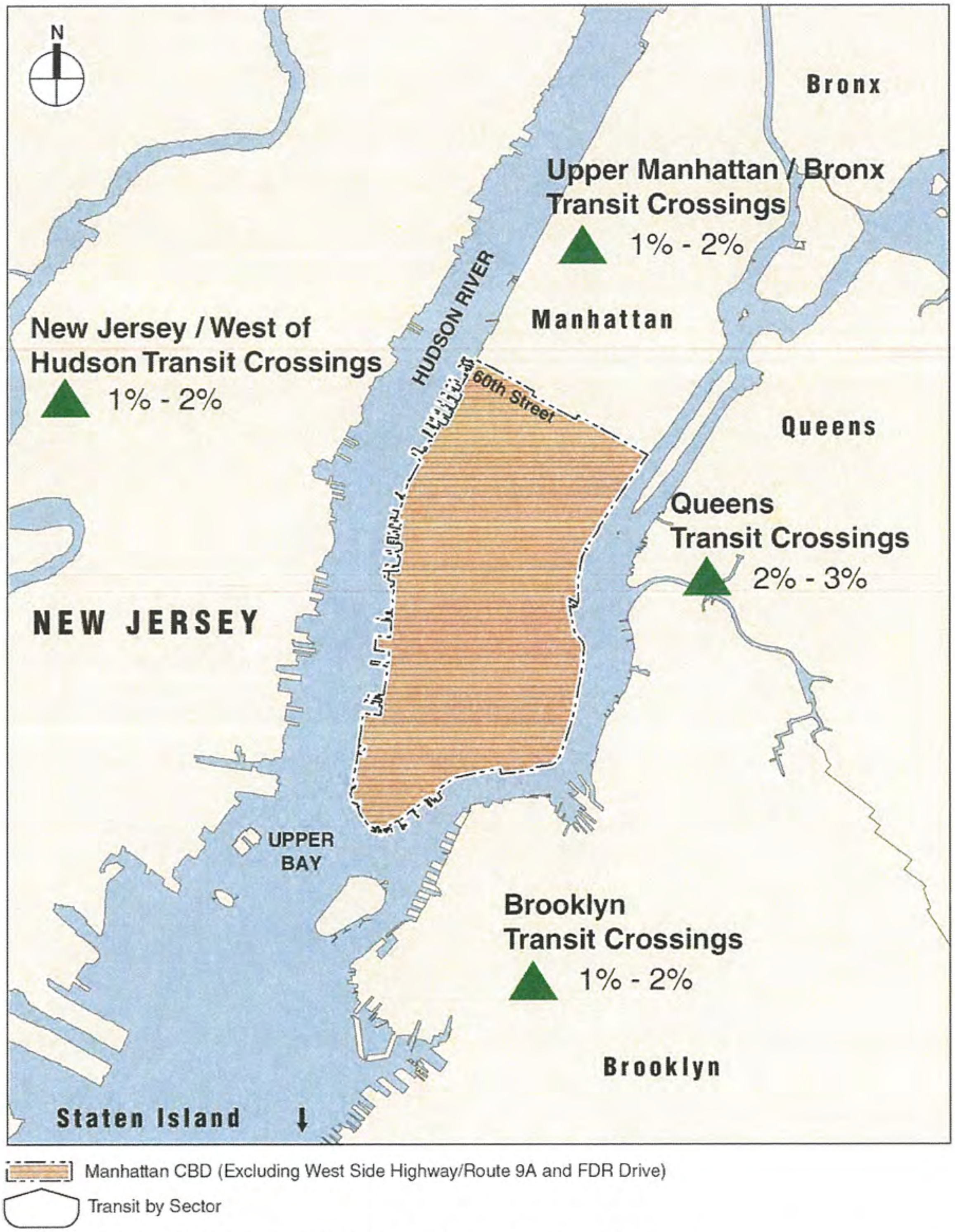
Source: WSP, Best Practice Model 2021.
Note: Average incremental ridership increase is the average increase in passengers among stations with hourly passenger increments over the 200 passenger threshold. Following CEQR guidance, stations with a projected net hourly increase of 200 passengers trigger detailed station analysis. No bus stops triggered detailed analysis.

Table 4C-11. Transit Stations Triggering Detailed Analysis and Average Incremental Ridership Increase Across Tolling Scenarios (PM Peak Hour)

TOLLING SCENARIO	PORT AUTHORITY TRANS-HUDSON (PATH)		NEW YOR CITY TRANSIT SUBWAY		COMMUTER RAIL		TOTAL
	Number of Stations Exceeding Threshold	Average Incremental Ridership Increase	Number of Stations Exceeding Threshold	Average Incremental Ridership Increase	Number of Stations Exceeding Threshold	Average Incremental Ridership Increase	Number of Stations Exceeding Threshold
A	0	—	16	323	2	305	20
B	0	—	15	343	3	365	18
C	1	259	16	356	4	408	20
D	2	241	16	409	3	572	20
E	2	313	18	411	3	669	24
F	2	289	16	416	4	582	25
G	1	287	15	330	4	267	20

Source: WSP, Best Practice Model 2021.
Note: Following CEQR guidance, stations with a projected net hourly increase of 200 passengers trigger detailed station analysis.
PM incremental ridership is based on a higher PM peak-hour factor, resulting in slightly different increments than with the AM peak hour in **Table 4C-4**.

Figure 4C-6. Projected Change in Transit Crossings Entering the Manhattan CBD by Sector (2023 AM Peak Period)



Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019*.
Note: Figure shows range of incremental percentage increases across all tolling scenarios. Tramway volumes were calculated using an incremental change factor derived from Queens/Roosevelt Island sector change per each tolling scenario.

Each sector also includes an assessment of maximum passenger load at the individual line level, based on *CEQR Technical Manual* guidance, which identifies a peak hour within the 4-hour peak period.[30] In these tables, lines are grouped by transit link location, and passenger load per line is associated with the tolling scenario with the highest ridership at the Manhattan CBD boundary. In cases where the line or bus meets the threshold of further analysis based on peak-hour volumes, details on trains or buses per hour, cars per train, and incremental new passengers at these two levels are provided.

Manhattan – 60th Street

With the CBD Tolling Alternative, the number of transit trips crossing into the Manhattan CBD at the 60th Street boundary would increase slightly (in the AM peak period), with an average incremental growth of 2.2 percent across the sector. For most transit lines, the greatest increase would occur under Tolling Scenario E (**Table 4C-12**).

Table 4C-12. Projected Transit Ridership by Route at the Boundary between 60th Street and the Manhattan CBD (2023 AM Peak Period, Inbound)

	NO ACTION ALTERNATIVE	REPRESENTATIVE TOLLING SCENARIO		CHANGE	PERCENTAGE CHANGE
Subway					
Broadway (Nos. 1/2/3)	74,725	76,571	E	1,846	2.5%
Lexington Avenue (Nos. 4/5/6)	89,537	91,610	E	2,073	2.3%
Eighth Avenue (A/C/B/D)	88,153	90,086	E	1,933	2.2%
Second Avenue (Q)	24,502	25,119	E	617	2.5%
Commuter Rail (Metro-North Railroad)					
Hudson, Harlem, New Haven	97,340	99,258	E	1,918	2.0%
Buses					
York Avenue (M31)	282	285	E	3	1.0%
Second Avenue (M15, M15-SBS)	3,032	3,062	E	30	1.0%
Lexington Avenue (B M1, M101)	1,610	1,626	E	16	1.0%
Fifth Avenue (B M10, B M11, B M18, B M3, B M4B, B M6, B M7, B M7A, B M9, M01, M02, M03, M04)	5,748	5,805	E	57	1.0%
Broadway (B M2, M05, M07, M10, M104, M20)	1,209	1,221	E	12	1.0%
Columbus Avenue (M11)	314	317	E	3	1.0%
West End Avenue (M57)	315	318	E	3	1.0%
Ferries/Tramway					
Ferries	1,106	1,122	E/F	16	1.5%

Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019.*

Note: Bus routes listed as identified in BPM. Bus volumes are calculated via average leave load at the bus stop before it crosses into the Manhattan CBD. Amtrak is not included in the BPM for modeled future conditions, because it is not considered a commuter transit choice in the BPM.

30 In coordination with MTA, an AM peak-hour factor of 26 percent was identified for NYC Transit subway and all bus ridership (and was used for other transit operators as well). Based on identification of the peak-hour per commuter rail operator, a factor of peak-period ridership for the peak hour was derived: 41 percent for LIRR, 43 percent for Metro-North, 43 percent for NJ TRANSIT.

For subways, the lowest percentage change would occur on the Eighth Avenue Line (2.2 percent) and the largest increases would occur on the Broadway and Second Avenue Lines (2.5 percent). Ridership on the Second Avenue Line would increase by the smallest number, though the percentage increase would be within the range of other lines.

Bus ridership would remain largely equivalent to the No Action Alternative, with increases of up to about 120 new riders across the 27 bus lines in the AM peak period (less than 2 percent). No individual bus route for this sector is projected to increase by 50 or more riders in the inbound peak hour. This increase would be below the CEQR threshold for further analysis, and no adverse effects on bus ridership are expected for the representative tolling scenario nor any of the tolling scenarios.

Table 4C-13 presents projected ridership changes on these transit lines at their maximum load point.[31] Three subway lines would exceed the CEQR threshold of an increase of 200 or more passengers in the peak hour, including the No. 1 subway line (projected to increase by 232 passengers), the No. 2 subway line (projected to increase by 210 passengers), and the No. 6 subway line (projected to increase by 288 passengers). The Metro-North commuter lines crossing at 60th Street are also expected to increase by over 200 passengers with an additional 311, 272, and 211 new passengers on the Harlem, Hudson, and New Haven lines, respectively. No other transit lines are projected to exceed 200 passenger increases at the maximum load point, indicating that there would be no adverse effects anticipated as a result of the CBD Tolling Alternative at these locations.

Table 4C-14 provides the additional assessment necessary to evaluate maximum load points that exceed 200 new passengers in the peak hour. The table provides the peak-hour increment broken down into an estimated number of new passengers per train and new passengers per car. CEQR guidance provides that an increase of fewer than 5 passengers per car would be considered as having no adverse effect. Based on the scheduled number of between 6 and 17 peak-hour trains and the standard number of 10 cars per train, the subway lines are projected to have increases of less than 5 passengers with between 1.13 (No. 6 line) and 2.89 (No. 2 line). For Metro-North commuter lines, the range is 1.26 (New Haven) to 2.99 (Hudson) new passengers per car, which is also below the CEQR line-haul capacity criteria for adverse effects. Metro-North scheduled service includes 18 peak-hour trains with an average of 8 cars on the Harlem line, 21 scheduled trains with an average of 8 cars on the New Haven line, and 13 peak-hour trains with an average of 7 cars on the Hudson line. In summary, no adverse effects are anticipated on line-haul for the 60th Street sector.

[31] As noted in **Section 4C.2**, the maximum load point was calculated for the representative tolling scenario. Additional analysis was conducted for any subway or commuter rail routes where 200 or more new passengers were predicted and for any bus route where 50 or more new bus riders were predicted in the AM peak hour. This was calculated for inbound passenger volumes destined for the Manhattan CBD.

Table 4C-13. Projected New Passenger-Trips at Maximum Load Point for Routes Crossing into the Manhattan CBD at the 60th Street Boundary, (2023 AM Peak Period and Hour)

MODE	NEW PASSENGER-TRIPS Peak Period	NEW PASSENGER-TRIPS Peak Hour
Subway		
Broadway		
No. 1	892	232
No. 2	807	210
No. 3	530	138
Lexington Avenue		
No. 4	558	145
No. 5	348	90
No. 6	870	226
Eighth Avenue		
A	690	179
B	387	101
C	220	57
D	636	165
Second Avenue (Q)	603	157
Commuter Rail (Metro-North Railroad)		
Harlem	722	311
Hudson	632	272
New Haven	494	212
Buses		
York Avenue 1 route	9	2
Second Avenue 2 routes	48	12
Lexington Avenue routes	38	10
Fifth Avenue 1 routes	103	27
Broadway routes	29	7
Columbus Avenue 1 route	7	2
West End Avenue 1 route	8	2

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: MTA NYCT data was used to analyze maximum load points for bus routes as of 2019. The tolling scenario used to derive this analysis matches the representative tolling scenario in **Table 4C-12.**

Table 4C-14. Projected Incremental Ridership Increases at Maximum Load Point for Routes Crossing into the Manhattan CBD at the 60th Street Boundary (2023 AM Peak Hour)

MODE	NEW PASSENGER-TRIPS		SCHEDULED TRAINS		NEW PASSENGER-TRIPS	
	Peak Period	Peak Hour	Trips/Hour	Cars/Train	Per Train	Per Car
Subway						
No. 1	892	232	19	10	13.64	1.36
No. 2	628	210	12	10	28.88	2.89
No. 6	870	226	20	10	11.31	1.13
Commuter Rail (Metro-North Railroad)						
Harlem	722	311	18	8	17.26	2.16
Hudson	632	272	13	7	20.92	2.99
New Haven	494	229	21	8	10.12	1.26

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: The tolling scenario used to derive this analysis matches the representative tolling scenario in Table 4C-12.

Queens/Roosevelt Island

With the CBD Tolling Alternative, in 2023 subway trips from Queens are projected to increase by less than 5 percent in the AM peak period in all tolling scenarios, with most subway lines having the largest increase in ridership under Tolling Scenario E. The N/R/W subway corridor would see the largest percentage increase (3.3 percent) at the boundary with the Manhattan CBD, which translates to 1,609 new riders, and the E/M subway lines would have the largest increase in numbers of passengers, with 1,889 new passengers between the two routes (an increase of 2.4 percent) (**Table 4C-15**).

Table 4C-15. Projected Transit Ridership at the Boundary between Queens/Roosevelt Island and the Manhattan CBD (2023 AM Peak Period, Inbound)

	NO ACTION ALTERNATIVE	REPRESENTATIVE TOLLING SCENARIO		CHANGE	PERCENTAGE CHANGE
Subway					
60th Street Tunnel (N/R/W)	48,940	50,548	E	1,609	3.3%
53rd Street Tunnel (E/M)	78,555	80,444	E	1,889	2.4%
Steinway Tunnel (No. 7)	68,283	70,122	E	1,839	2.7%
63rd Street Tunnel (F)	53,897	54,970	E	1,073	2.0%
Commuter Rail (Long Island Rail Road)					
All Routes	83,870	85,825	E	1,955	2.3%
Buses					
Queens-Midtown Tunnel (BQM1, BM5, QM1, QM1A,QM2, QM3 QM4, QM5, QM6, QM7, QM8, QM10, QM11, QM12, QM15, QM16, QM17, QM18, QM20, QM21, QM24, QM25, QM31, QM32, QM34, QM35, QM36, 63, 64, 68)	8,601	8,695	E	94	1.1%
Ed Koch Queensboro Bridge (Q101, Q32, Q60)	777	786	E	9	1.1%
Ferries/Tramway					
Ferries	5,561	5,733	E	172	3.1%
Roosevelt Island Tramway	859	878	E	22	2.6%

Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019*.

Note: Bus routes are listed as identified in the BPM. Bus volumes are calculated via average leave load at the bus stop before it crosses into the Manhattan CBD. Amtrak is not included in the BPM for modeled future conditions, because it is not considered a commuter transit choice in the BPM.

* Forecasts for Queens-Midtown Tunnel ridership have been estimated from the *Hub Bound Travel Data Report 2019* using the growth factor for all bus boardings per tolling scenario.

** Forecasts for ridership on the Roosevelt Island Tramway have been estimated using a growth factor based on a rate calculated using historic data collected through NYMTC. Tolling scenario ridership projections were based on the rate of change for all transit in the sector as modeled in the BPM.

Bus routes that enter the Manhattan CBD from Queens/Roosevelt Island would see the greatest ridership increases under Tolling Scenarios E and F. These routes are projected to increase by a relatively small number of passengers; buses crossing the Queens-Midtown Tunnel and Ed Koch Queensboro Bridge are not projected to see an increase of 50 or more new passengers. For LIRR ridership, the greatest rate of change would occur with Tolling Scenario E. Ferry trips and the Roosevelt Island Tramway would play a smaller role in the transportation system for trips entering the Manhattan CBD from the Queens/Roosevelt Island sector.

Table 4C-16 shows the increment at the maximum load point for each transit line entering the Manhattan CBD, and **Table 4C-17** shows the results of the detailed analysis of line-haul capacity for transit lines. Each line on the N/R/W corridor from Queens/Roosevelt Island would not have an increase of more than 200 passengers in the peak hour and therefore do not warrant further analysis. Three subway lines connecting Queens to the Manhattan CBD would exceed the threshold of 200 new passengers in the AM peak hour. The E subway line ridership is projected to increase by 228 passengers, which would be 1.52 new passengers per car. The M subway line ridership, projected to increase by 264 passengers, would add 2.93 passengers per car. The additional 279 passengers on the F subway line would translate to 1.86 new passengers per car, which is lower than the impact threshold of 5 or more new passengers per car. The No. 7 local subway line is projected to increase by 377 riders in the AM peak hour—equivalent to 2.45 new passengers per car, which would be lower than the threshold for an adverse effect. For the LIRR, only the Babylon Branch with 331 new peak-hour passengers is projected to have an increase of greater than 200 passengers. Based on the scheduled 10 trains in the peak hour with an average of 10 cars per train, this results in 3.31 new passengers per car on average, which remains below the adverse effect threshold of 5 new passengers per car. No bus routes from Queens are projected to increase by over 50 passengers. In summary, none of the passenger increases on transit lines from Queens/Roosevelt Island would result in an adverse effect.

Table 4C-15. Projected New Passenger-Trips at Maximum Load Point for Routes Crossing into the Manhattan CBD from Queens/Roosevelt Island, (2023 AM Peak Hour)

MODE	PEA PERIOD	AM PEA HOUR
Subway		
60th Street Tunnel (R)	657	171
60th Street Tunnel		
N	386	100
W	369	96
53rd Street Tunnel		
M	1,014	264
E	876	228
Steinway Tunnel		
No. 7 (Local)	1,449	377
No. 7 (Express)	600	156
63rd Street Tunnel (F)	1,073	279
Commuter Rail (Long Island Rail Road)		
Babylon	808	331
Far Rockaway	147	60
Hempstead	127	52
Long Beach	50	20
Montauk	18	8
Oyster Bay	32	13
Port Jefferson	276	113
Port Washington	368	151
Ronkonkoma	232	95
West Hempstead	0	0
Buses		
Queens-Midtown Tunnel routes	94	25
Ed Koch Queensboro Bridge routes	41	11

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.

Note: The tolling scenario used to derive this analysis matches the representative tolling scenario in Table 4C-15. The projected ridership changes have been rounded to zero (0) for estimates at or below zero, to account for variability/noise in the BPM for lines where existing ridership is already relatively low. MTA NYCT data was used to analyze maximum load points for bus routes as of 2019.

Table 4C-16. Projected Incremental Ridership Increases at Maximum Load Point for Queens/Roosevelt Island (2023 AM Peak Hour)

MODE	NEW PASSENGER-TRIPS		SCHEDULED TRAINS		NEW PASSENGER-TRIPS	
	Peak Period	Peak Hour	Trips our	Cars Train	Per Train	Per Car
Subway						
53rd Street Tunnel						
M	1,014	264	9	10	29.28	1.93
E	876	228	15	10	15.18	1.52
Steinway Tunnel						
No. 7 (Local)	1,449	377	14	11	26.90	2.45
63rd Street Tunnel (F)	1,073	279	15	10	18.60	1.86
Commuter Rail (Long Island Rail Road)						
Babylon	808	331	10	10	33.1	3.31

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.

Note: The tolling scenario used to derive this analysis matches the representative tolling scenario in **Table 4C-15**. Because no bus routes met the threshold of 50 new passengers, none are included in this table.

Brooklyn

With the CBD Tolling Alternative, subway, ferry and bus ridership between Brooklyn and the Manhattan CBD would see increases under all tolling scenarios (**Table 4C-18**). These increases would be less than 4 percent on any given subway line or ferry and approximately 6 percent for buses. During the AM peak period, Tolling Scenario F would increase subway ridership from Brooklyn the most (although the tolling scenario projections would have limited variation). Projected incremental passengers range from 1.3 to 2.7 percent for subway lines. The largest increases in bus ridership would occur under Tolling Scenario B with 136 riders (a nearly 9 percent increase).

Table 4C-17. Projected Transit Ridership by Routes at the Boundary between Brooklyn and the Manhattan CBD (2023 AM Peak Period, Inbound)

	NO ACTION ALTERNATIVE	REPRESENTATIVE TOLLING SCENARIO		CHANGE	PERCENTAGE CHANGE
Subway					
Canarsie Tunnel (L)	42,607	43,583	F	976	2.3%
Williamsburg Bridge (J/M/Z)	37,216	38,411	F	1,195	3.2%
Rutgers Street Tunnel (F)	37,006	37,921	F	915	2.5%
Manhattan Bridge (B/D/N/Q)	100,921	103,654	D	2,734	2.7%
Cranberry Street Tunnel (A/C)	66,013	67,173	F	1,160	1.8%
Clark Street Tunnel (Nos. 2/3)	29,316	30,073	E	757	2.6%
Montague Street Tunnel (R)	10,143	10,301	F	158	1.6%
Joralemon Street Tunnel (Nos. 4/5)	28,696	29,446	D	750	2.6%
Buses					
Hugh L. Carey Tunnel (BM1, BM2, BM3, BM4)	4,376	4,421	B	45	1.0%
Williamsburg Bridge (B39)	29	29	B	0	1.0%
Ferries/Tramway					
Ferries	3,462	3,513	F	51	1.5%

Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019*; analysis prepared by WSP and FHI Studio.

Note: MTA NYCT data was used to analyze bus routes as of 2019. Bus volumes are calculated via average leave load at a bus stop before a bus crosses into the Manhattan CBD.

No bus routes with an origin point in Brooklyn are projected to see an increase of more than 50 new passengers in the AM peak hour, the CEQR threshold for further analysis, indicating that there would be no adverse effect from the change in ridership.

As summarized in **Table 4C-19**, the A, D, F, and L subway lines are projected to have an increase of more than 200 riders in the AM peak hour, while the incremental change would be below 200 riders for the Manhattan-bound Nos. 2/3; Nos. 4/5; and C, J/M, N/Q, and R subway lines.

Table 4C-18. Projected New Passenger-Trips at Maximum Load Point for Routes Crossing into the Manhattan CBD from Brooklyn (2023 AM Peak Period and Hour)

MODE	AM PEA PERIOD	AM PEA HOUR
Subway		
Clark Street Tunnel		
No. 2	165	43
No. 3	345	90
Joralemon Street Tunnel		
No. 4	664	173
No. 5	588	153
Cranberry Street Tunnel		
A	859	224
C	334	87
Rutgers Street Tunnel (F)	1,033	269
Canarsie Tunnel (L)	976	254
Williamsburg Bridge		
J	674	175
M	502	130
Manhattan Bridge		
B	616	160
D	867	226
N	634	165
Q	685	178
Montague Street Tunnel (R)	640	166
Buses		
Hugh L. Carey Tunnel routes	45	12
Williamsburg Bridge 1 route	0	0

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: MTA NYCT data was used to analyze maximum load points for bus routes as of 2019. The tolling scenario used to derive this analysis matches the representative tolling scenario in Table 4C-17.

Table 4C-20 summarizes the maximum load point analysis for the four subway lines exceeding the 200-passenger increase in the AM peak hour:

- The A subway line with a projected increase of 224 passengers and 1.64 new passengers per subway car on average
- The D subway line with 226 new passengers or about 2.82 per car
- The F subway line with 269 new passengers or 2.07 per car
- The L subway line with 254 new passengers or 1.59 per car

These increases are all below the threshold increment of 5 or more new passengers per car, and there would be no anticipated adverse effect on any transit lines entering the Manhattan CBD from Brooklyn.

Table 4C-19. Projected Incremental Ridership Increases at Maximum Load Point for Brooklyn (2023 AM Peak Hour)

MODE	NEW PASSENGER-TRIPS Peak Period	NEW PASSENGER-TRIPS Peak Hour	SCHEDULED TRAINS Trips/Hour	SCHEDULED TRAINS Cars/Train	NEW PASSENGER-TRIPS Per Train	NEW PASSENGER-TRIPS Per Car
Subway						
Cranberry Street Tunnel (A)	858	224	17	8	13.13	1.64
Rutgers Street Tunnel (F)	1,033	269	13	10	20.67	2.07
Canarsie Tunnel (L)	976	254	20	8	12.69	1.59
Manhattan Bridge (D)	867	226	10	8	28.18	2.82

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: The tolling scenario used to derive this analysis matches the representative tolling scenario in **Table 4C-17**. Because no bus routes met the threshold of 50 new passengers, none are included in this table.

Staten Island

With the CBD Tolling Alternative, passenger-trips by ferry from Staten Island to the Manhattan CBD during the AM peak period are projected to increase by about 7 percent under the representative tolling scenario (**Table 4C-21**). Many of these passengers could be transferring to buses and subways in the Manhattan CBD, which is accounted for in the BPM results.

Table 4C-20. Projected Transit Ridership by Routes Crossing into the Manhattan CBD from Staten Island (2023 AM Peak Period, Inbound)

	NO ACTION	REPRESENTATIVE TOLLING SCENARIO		CHANGE	PERCENTAGE CHANGE
Ferry	17,768	19,002	C	1,234	6.9%
Buses					
Hugh L. Carey Tunnel (SIM1, SIM2, SIM3, SIM4, SIM5, SIM6, SIM7, SIM9, SIM10, SIM11, SIM15, SIM31, SIM31, SIM32, SIM33, SIM34, SIM35)	10,236	10,837	C	601	5.9%
Lincoln Tunnel (SIM8, SIM22, SIM25, SIM26, SIM30)	2,906	3,049	C	143	4.9%

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: MTA NYCT data was used to analyze bus routes as of 2019. (Staten Island Express Bus Routes SIM23 and SIM24 were operated by Academy Bus Company via contract with the New York City Economic Development Corporation in 2019, but as of January 2022, the routes are now operated by MTA Bus.) Bus volumes are calculated via the average leave load at the bus stop before it crosses into the Manhattan CBD. Due to rounding, some numbers in this table may not add up.

Ridership on express bus routes from Staten Island via New Jersey would increase under the representative tolling scenario, with an increase of 5.9 percent on buses via Brooklyn and 4.9 percent on buses via New Jersey. This translates to fewer than 50 new passengers on all buses; no bus routes with an origin point in Staten Island are projected to see an increase of more than 50 new passengers in the AM peak hour. Therefore, no adverse effects are anticipated from the representative tolling scenario nor any of the CBD Tolling Alternative scenarios.

The Staten Island Ferry serves commuters who transfer from the Staten Island Railway or from local buses, who bike or walk to the ferry terminal, and who arrive by vehicle. Rides on the ferry are also a popular tourist activity. It is expected that ridership on the new NYC Ferry St. George route (launched in 2021) would divert some travelers who previously used the Staten Island Ferry, because the NYC Ferry would provide a convenient connection to western Midtown Manhattan for some commuters in place of a transfer to the subway in Lower Manhattan to reach Midtown. No adverse effects on Staten Island Ferry service levels are expected as a result of the CBD Tolling Alternative.[32]

Table 4C-22 shows the increment at the maximum load point for Staten Island express buses that travel within Brooklyn and New Jersey to enter the Manhattan CBD. No bus routes within this sector are projected to experience over 50 new passengers.

Table 4C-21. Projected New Passenger-Trips at Maximum Load Point for Staten Island Express Bus Routes (2023 AM Peak Period and Hour)

MODE	AM PEA PERIOD	AM PEA HOUR
Bus		
Staten Island express via Hugh L. Carey Tunnel 1 routes	447	116
Staten Island express via Lincoln Tunnel routes	66	17

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: MTA NYCT data was used to analyze maximum load points for bus routes as of 2019. The tolling scenario used to derive this analysis matches the representative tolling scenario in **Table 4C-20**.

New Jersey/West of Hudson

The CBD Tolling Alternative would result in modest increases in ridership on transit services from the New Jersey/west-of-Hudson sector (**Table 4C-23**). The largest change as a percentage, would occur on PATH service to Midtown Manhattan (33rd Street), which would see 1,555 new passengers in the AM peak period with Tolling Scenario E, an increase of 3.8 percent. PATH service to Lower Manhattan (World Trade Center) would have a smaller increase, with an estimated 1,201 new passengers in the AM peak period (an increase of 1.7 percent). Ridership would increase by 2.3 percent under Tolling Scenario E for NJ TRANSIT rail service. For buses from New Jersey, ridership would increase less than 2 percent, with 1,656 new passengers on buses through the Lincoln and Holland Tunnels with the representative tolling scenario for each (Tolling Scenarios E and D, respectively). Privately operated ferries would see the greatest increases under Tolling Scenario D, with a projected increase of 207 new passengers.

[32] Based on an analysis of the projected increase in morning peak hour ridership on the Staten Island Ferry and based on the capacity of each ferry and the frequency of operation, adverse effects are not anticipated from the Project.

Table 4C-22. Projected Transit Ridership by Routes at the Boundary between New Jersey/West-of-Hudson and Manhattan CBD (2023 AM Peak Period, Inbound)

	NO ACTION	REPRESENTATIVE TOLLING SCENARIO		CHANGE	PERCENTAGE CHANGE
Subway					
PATH (33rd Street)	40,731	42,286	E	1,555	3.8%
PATH (World Trade Center)	71,773	72,974	F	1,201	1.7%
Commuter Rail					
NJ TRANSIT	59,721	61,068	E	1,348	2.3%
Buses					
Lincoln Tunnel	106,849	108,390	E	1,541	1.4%
Holland Tunnel	6,431	6,547	D	116	1.8%
Ferries/Tramway					
Ferries	8,123	8,329	D	207	2.5%

Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019;* analysis prepared by WSP and FHI Studio.

Note: Metro-North west-of-Hudson service connects to the Manhattan CBD via a transfer at Secaucus Junction. Those riders represent a small proportion of total west-of-Hudson trips and are included under the Commuter Rail/NJ TRANSIT classification in these results summaries.

* Bus routes listed as identified in BPM:
NJ TRANSIT Lincoln Tunnel: #107, #108, #112, #113, #114, #115, #116, #117, #119, #122, #123, #125, #126, #127, #128, #129, #130, #131, #132, #133, #135, #136, #137, #138, #139, #144, #145, #148, #151, #153, #154, #155, #156, #157, #158, #159, #160, #161, #162, #163, #164, #165, #166, #167, #168, #177, #190, #191, #192, #193, #194, #195, #196, #197, #199, #319, #320, #321, #324
NJ TRANSIT Holland Tunnel: #120
Other Carriers Lincoln Tunnel: Bergen County/Suffern, CC Route 77, DC Route 32, DC Route 33, DC Route 44, DC Route 66, DC Route 88, DC Route 99, Jackson – Midtown, Jackson – PABT, Lincroft/Exit 109 – PABT, LK 46/80 to PABT, LK 46/80 to Wall St., LK 78 to PABT, LK 80 to PABT, Monsey – Midtown, MZ, Orange – Chester/Midtown, Orange – Newburgh/West Pt, Orange xPA84, Palisades, Pkwy Exp – PABT, PNC Center – PABT, Route 100 to PABT, Route 300/8A to Midtown, Route 300/8A to PABT, Route 35 – PABT, Route 36 – PABT, Route 400 Express to PABT, Route 500 to Midtown, Route 55 – Bloomfield, RT 11A, Rt 14 – PABT, RT 20 – PABT, RT 21, RT 45, RT 46, RT 47, RT 49, RT 9 – PABT, Sayreville – Midtown, TB North, TB South
Other Carriers Holland Tunnel: Jackson – Downtown, Lincroft/Exit 109 – Wall St, Pkwy Exp – Wall St, PNC Center, Red Bank, Route 300/8A, Route 36 – Wall St, Route 600 to Wall St, Route 9 to Wall St, Sayreville – Wall St, TB North to Wall St, West Caldwell

Table 4C-24 shows the increment of passengers at the maximum load point for transit lines entering the Manhattan CBD via New Jersey. The 33rd Street PATH line from Hoboken would have an increase of 234 new passengers in the AM peak hour, which is above the CEQR 200 passenger increase per peak-hour threshold for line-haul analysis. Based on BPM results, no bus routes would have increases of more than 50 new passengers in the AM peak hour in the representative tolling scenario.[33] Although total NJ TRANSIT commuter rail ridership would increase by more than 200 passengers overall, no individual routes would increase by more than 200 new passengers.

[33] Although the BPM projects ridership for individual routes, these route-specific projections do not have a high level of accuracy; therefore, increases are discussed relative to the route "family" for this assessment, although it is likely that route patterns do not all cover all bus stops for the route family.

Table 4C-23. Projected New Passenger-Trips at Maximum Load Point for Routes Crossing into the Manhattan CBD from New Jersey/West of Hudson (2023 AM Peak Period and Peak Hour)

MODE	AM PEA PERIOD	AM PEA HOUR
Subway		
PATH (33rd Street)		
Hoboken Line	898	234
Journal Square Line	657	171
PATH (World Trade Center)		
Hoboken Line	605	157
Newark Line	596	155
Commuter Rail (NJ TRANSIT)		
Montclair-Boonton Line	305	125
Morris Essex Line	273	112
Northeast Corridor Line	420	172
North Jersey Coast Line	309	127
Buses		
Lincoln Tunnel (104 routes)	1,462	380
Holland Tunnel (13 routes)	91	24

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: The tolling scenario used to derive this analysis matches the representative tolling scenario in **Table 4C-22**.
* Metro-North west-of-Hudson commuter trains (Port Jervis, Pascack Valley) transfer at Secaucus Junction to enter the Manhattan CBD and are therefore incorporated into NJ TRANSIT incremental passenger-trips.

As shown in **Table 4C-25**, the increases on the PATH 33rd Street Hoboken line are estimated to result in an average increase of about 3.34 new passengers per car, which is below the 5-passenger threshold, indicating that there would be no adverse effect. In summary, no transit line originating in New Jersey would result in an adverse effect on maximum load point for the representative tolling scenario and, therefore, for any tolling scenario.

Table 4C-24. Projected Incremental Ridership Increases at Maximum Load Point for New Jersey/West of Hudson (2023 AM Peak Hour)

MODE	NEW PASSENGER-TRIPS		SCHEDULED BUSES/TRAINS		NEW PASSENGER-TRIPS	
	Peak Period	Peak Hour	Trips/Hour	Cars/Train	Per Train/Bus	Per Car
Subway						
PATH (33rd Street)						
Hoboken	898	234	10	7	23.35	3.34

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: The tolling scenario used to derive this analysis matches the representative tolling scenario in **Table 4C-22**.

4C.4.2.4 EVALUATION OF BUSES ACROSS SECTORS

In early public outreach, concerns regarding increases in bus ridership that could result from Project implementation were expressed. Commenters asked if additional buses would be needed to account for ridership increases. Based on the line-haul capacity analysis results, which examined bus ridership at the point where the route would be the most crowded, no buses would cross the threshold for requiring detailed line-haul analysis; therefore, no adverse effects on bus lines are projected. This means that no new buses would be required to support ridership increases stemming from the Project.

Local Bus Ridership

As shown in **Table 4C-26**, overall bus ridership is projected to increase slightly due to the Project, from 1.0 percent (in Tolling Scenario B) to 1.4 percent (in Tolling Scenarios E and F). The analysis considered the change in overall bus ridership due to the Project, examining the aggregation of bus ridership into three groupings or categories of bus routes: "cordon" bus routes (which pass through the Manhattan CBD tolling cordon or boundary); "feeder" bus routes (which serve at least one rail station); and "local" bus routes (which do not cross the Manhattan CBD cordon or serve a rail station).

Table 4C-25. Projected Change in Bus Ridership Among Scenarios Compared to No Action Alternative (2023 AM Peak Period)

TYPE OF BUS ROUTE	TOLLING SCENARIO A	TOLLING SCENARIO B	TOLLING SCENARIO C	TOLLING SCENARIO D	TOLLING SCENARIO E	TOLLING SCENARIO F	TOLLING SCENARIO G
Change in ridership vs. No Action Alternative							
Cordon bus routes	4,554	3,657	5.543	6,470	7,806	6,105	4,886
Feeder bus routes	23,813	23,577	28,877	27,523	29,047	29,770	23,082
Local bus routes	977	681	676	748	977	1,159	741
Total Change vs. No Action Alternative	29,345	27,916	35,097	34,742	37,830	37,034	28,709
Percentage change in ridership vs. No Action Alternative							
Cordon bus routes	1.0%	0.8%	1.2%	1.4%	1.6%	1.3%	1.0%
Feeder bus routes	1.1%	1.1%	1.4%	1.3%	1.4%	1.4%	1.1%
Local bus routes	1.2%	0.8%	0.8%	0.9%	1.2%	1.4%	0.9%
Total Change vs. No Action Alternative	1.1	1.0	1.3	1.3	1.4	1.4	1.1

Source: WSP, Best Practice Model 2021.
Note: Data total over a 4-hour period, defined as total boardings, which include transfers. (Because this ridership estimate includes transfers, the ridership reported is greater than MTA NYCT MetroCard data that is widely available.) The BPM includes MTA buses, NJ TRANSIT buses, smaller regional bus carriers, and private carriers. (Other smaller carriers and private carriers are included under "Other Buses.")

Based on BPM results for 2023, the projected systemwide increases in bus ridership for the morning peak period across the seven tolling scenarios (A, B, C, D, E, F, and G) would range between 0.7 and 1.6 percent for cordon, feeder, and local bus routes. For any given tolling scenario, local buses routes would mostly have a lower percentage increase than feeder or cordon routes. Under Tolling Scenario A, B, and F, some local bus routes would have a higher percentage increase than feeder routes, or both feeder and cordon routes.

With each bus accommodating 54 to 85 passengers, such increases would, on average, amount to no more than one or two additional passengers per bus. This level of increase in bus ridership is generally imperceptible and is anticipated as a 1.0 to 1.4 percent average increase, systemwide.

A closer look was taken at subway stations that may serve as important transfer points between buses and subways, to examine whether the increased bus ridership could be more pronounced at those locations. Twenty-three subway stations (see **Table 4C-27** and **Table 4C-28**) are projected to serve more than 200 additional passengers in the AM peak hour under the CBD Tolling Alternative. Five stations outside Manhattan are projected to see increases above the 200-passenger increment threshold (Court Square, Atlantic Av – Barclays Center, Flushing-Main Street, Broadway Junction, 168 St – Washington Heights), with increments between 204 and 332 in the AM peak hour.

At most of the 23 subway stations identified above, based on inputs from NYCT operations planners, approximately 10 percent of the total increment of subway passengers would be a result of transfers to/from buses. This proportion was applied to estimate the amount of passenger volumes attributed to bus-to-subway or subway-to-bus transfers that would traverse station fare control area and vertical circulation elements.

4C.4.2.5 TRANSIT STATION ASSESSMENT

This section provides an assessment of the CBD Tolling Alternative's effect on specific transit stations where the number of passengers would exceed the CEQR threshold of 200 incremental peak-hour passengers. As indicated in **Section 4C.4.2**, this assessment uses Tolling Scenario E as the representative tolling scenario with the largest increase in transit ridership overall relative to the No Action Alternative. The results of this analysis provide an understanding of the likely range of anticipated adverse effects from the proposed Project and identify potential improvement strategies to address these effects.

Under the CBD Tolling Alternative, the regional transit system is projected to see overall increases of under 2 percent increase although ridership increases would vary by mode and station. This analysis considers whether projected increases in passenger volumes at specific stations would adversely affect facility elements used by passengers and whether improvements at those stations would be necessary to avoid potential adverse effects.

According to the *CEQR Technical Manual,* transit station analyses may be warranted if a proposed project is expected to generate 200 new passenger movements in a peak hour at a given station. Based on BPM results for 2023, the transit stations where the CBD Tolling Alternative (Tolling Scenario E) would add more than 200 new passengers during the peak hour (including all transfers, boardings, and alightings) were identified. Passengers transferring between cross-platform lines were not included because transferring passengers would not interact with FCA and VCE station circulation elements (turnstiles, stairs, escalators). However, transfers to another line within the same station complex or transfers to/from bus routes outside of the station were included because these incremental movements could affect the function of station circulation elements.

Locations of Stations Exceeding Threshold

Based on the BPM results for 2023, 26 commuter rail and subway stations are projected to have ridership increases of more than 200 new passengers with most stations located within New York City. For locations where the CEQR screening assessment indicates that further analysis is warranted, the *CEQR Technical Manual* calls for evaluation of capacity of the notable FCA and VCE station elements in the path of travel. **Table 4C-27** shows projected AM peak-hour increments, and **Table 4C-28** provides the corresponding PM peak-hour increments. (PM increments were estimated in coordination with NYCT by applying a different peak-hour factor onto the BPM AM peak-period results.)

Five of the stations meeting the threshold are affiliated with cross-Hudson trips—either in New Jersey or the Manhattan CBD. In New Jersey, three transit stations would have an increase of more than 200 passengers: Secaucus Junction Station, Hoboken Terminal, and Newark Penn Station. The other two stations are at New Jersey-serving hubs inside the Manhattan CBD. At Secaucus—one of a few major transfer points between northern New Jersey and Rockland and Orange Counties, New York—commuters primarily transfer rather than enter the station from the street. Hoboken Terminal is an important transfer point between PATH and NJ TRANSIT, where the increase in ridership would be fairly evenly split between the two services). At Newark Penn Station, a major hub and transfer station for NJ TRANSIT train and bus service and PATH, the CBD Tolling Alternative would also add a projected 148 new passengers for PATH and 181 passengers for NJ TRANSIT.

The increases at each of these hubs also include a substantial transfer volume. Of the 23 stations where the new passengers resulting from the CBD Tolling Alternative would exceed the screening threshold within New York City, nearly two-thirds are within the Manhattan CBD (**Figure 4C-7**). In addition, four stations are in Queens, two are in Brooklyn, and two are in Upper Manhattan/the Bronx (**Table 4C-27**). At some of these stations, planned or programmed improvements independent of the CBD Tolling Alternative will increase station capacity. Measures to be implemented by private developers related to the City of New York's recent rezoning of East Midtown will provide capacity improvements at some East Side subway stations. Other MTA capital improvements are planned at various stations which may alleviate relatively minor ridership increases.

Among those identified to incur incremental trips exceeding the CEQR analysis threshold, the largest increases are expected to occur at the Manhattan CBD's large station complexes. These stations accommodate substantial transfer movements among different subway lines that serve various parts of the city. They also accommodate intermodal transfers, in the case of Grand Central Terminal and Penn Station New York with commuter rail lines, and in the case of Times Square with commuter bus routes that serve the greater metropolitan area.

Table 4C-26. Transit Stations with More than 200 Projected New Passengers in the AM Peak Hour (Tolling Scenario E, 2023)

STATION NAME	OPERATOR	LINE	NO ACTION Ons/Offs	TOLLING SCENARIO E Ons/Offs	NET ONS/OFFS	NET PERCENTAGE CHANGE	LOCATION
New York-Penn Station	LIRR/NJ TRANSIT	—	61,663	63,043	1,380	2.2%	Manhattan CBD
Times Sq-42 St/42 St-Port Authority Bus Terminal	NYCT	Nos. 1, 2, 3, 7, and A, C, E, N, Q, R, S, W	67,299	68,655	790	1.2%	Manhattan CBD
Grand Central-42 St	NYCT	Nos. 4, 5, 6, 7, and S	40,779	41,858	761	1.9%	Manhattan CBD
New York-Grand Central Terminal	Metro-North	—	42,262	43,301	619	1.4%	Manhattan CBD
14 St-Union Square	NYCT	Nos. 4, 5, 6, and L, N, Q, R, W	40,216	41,263	585	1.5%	Manhattan CBD
Secaucus	NJ TRANSIT	—	10,279	10,834	555	5.4%	New Jersey
Hoboken Terminal	NJ TRANSIT	—	10,000	10,501	501	5.0%	New Jersey
Fulton St	NYCT	Nos. 2, 3, 4, 5, and A, C, J, Z	19,681	20,242	495	2.5%	Manhattan CBD
Lexington Av/59 St	NYCT	Nos. 4, 5, 6, and N, R, W	34,441	35,181	455	1.3%	Manhattan CBD
Lexington Av/53 St – 51 St	NYCT	No. 6, and E, M	15,758	16,205	395	2.5%	Manhattan CBD
42 St-Bryant Park-5 Av	NYCT	No. 7, and B, D, F, M	23,759	24,291	342	1.4%	Manhattan CBD
Broadway-Lafayette St and Bleecker St	NYCT	No. 6, and B, D, F, M	25,368	25,991	341	1.3%	Manhattan CBD
Court Square	NYCT	No. 7, and E, G, M	21,824	22,330	332	1.5%	Queens
59 St-Columbus Circle	NYCT	No. 1, and A, B, C, D	36,042	36,727	326	0.9%	Manhattan CBD
34 St-Herald Sq	NYCT	B, D, F, M, N, Q, R, W	30,662	31,230	319	1.0%	Manhattan CBD
Hoboken Terminal (PATH)	PANYNJ	—	7,433	7,749	316	4.2%	New Jersey
Atlantic Av-Barclays Center	NYCT	Nos. 2, 3, 4, 5, and B, Q, D, N, R	34,379	35,016	313	0.9%	Brooklyn
Port Authority Bus Terminal	PANYNJ	—	23,393	23,694	301	1.3%	Manhattan CBD
14 St (Sixth Av/Seventh Av)	NYCT	No. 1, 2, 3, and F, M, L	18,085	18,476	268	1.5%	Manhattan CBD
World Trade Center Station	PANYNJ	—	20,864	21,129	264	1.3%	Manhattan CBD
Flushing-Main St	NYCT	No. 7	14,839	15,100	261	1.8%	Queens
Broadway Junction	NYCT	A, C, J, L, Z	20,441	20,888	245	1.2%	Queens
Canal St (6, J, N, Q, R, Z)	NYCT	No. 6, and N, Q, R, W, J, Z	11,000	11,283	230	2.1%	Manhattan CBD
34 St-Penn Station	NYCT	A, C, E	12,321	12,553	213	1.7%	Manhattan CBD

STATION NAME	OPERATOR	LINE	NO ACTION Ons/Offs	TOLLING SCENARIO E Ons/Offs	NET ONS/OFFS	NET PERCENTAGE CHANGE	LOCATION
168 St-Washington Heights	NYCT	No. 1, and A, C	11,155	11,437	204	2.5%	Manhattan
Newark Penn Station	NJ TRANSIT	—	20,390	20,571	181	0.9%	New Jersey
Newark Penn Station (PATH)	PANYNJ	—	9505	9,653	148	1.6%	New Jersey

Source: WSP, Best Practice Model 2021.

Note: All stations with free connections have aggregated volumes. Peak-hour incremental change was calculated as an average 26 percent peak-hour to peak-period ratio in the AM for NYCT subways, PATH trains, and buses; 43 percent peak-hour to peak-period ratio for Metro-North and NJ TRANSIT; and 41 percent peak-hour to peak-period ratio for LIRR. Net ons/offs include subway-to-bus, subway-to-subway, and bus-to-subway transfers and is not a direct calculation of Tolling Scenario E minus No Action Alternative incremental trips.

Table 4C-27. Transit Stations with More than 200 Projected New Passengers in the PM Peak Hour (Tolling Scenario E, 2023)

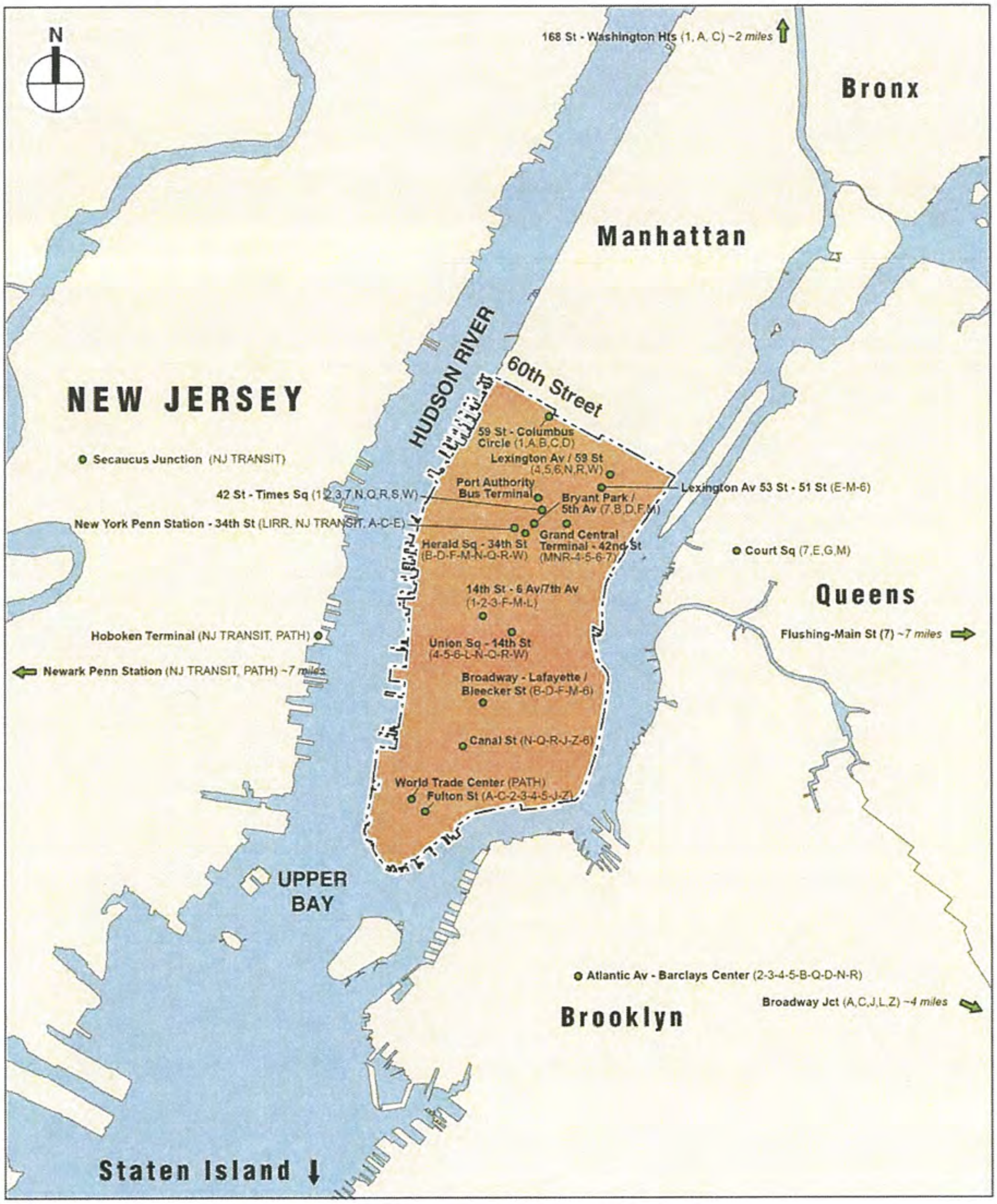
STATION NAME	OPERATOR	LINE	NO ACTION Ons/Offs	TOLLING SCENARIO E Ons/Offs	NET ONS/OFFS	NET PERCENTAGE CHANGE	LOCATION
New York-Penn Station	LIRR/NJ TRANSIT	—	61,663	63,043	1,380	2.2%	Manhattan CBD
Times Sq-42 St/42 St-Port Authority Bus Terminal	NYCT	Nos. 1, 2, 3, 7 and A, C, E, N, Q, R, S, W	72,476	73,936	851	1.2%	Manhattan CBD
Grand Central-42 St	NYCT	Nos. 4, 5, 6, 7 and S	43,916	45,078	820	1.8%	Manhattan CBD
14 St-Union Square	NYCT	Nos. 4, 5, 6, and L, N, Q, R, W	43,309	44,437	630	1.4%	Manhattan CBD
Grand Central Terminal	Metro-North	—	42,682	43,301	619	1.4%	Manhattan CBD
Secaucus	NJ TRANSIT	—	10,279	10,834	555	5.4%	New Jersey
Fulton St	NYCT	Nos. 2, 3, 4, 5, and A, C, J, Z	21,195	21,799	533	2.4%	Manhattan CBD
Hoboken	NJ TRANSIT	—	10,000	10,501	501	5.0%	New Jersey
Lexington Ave/59 St	NYCT	Nos. 4, 5, 6, and N, R, W	37,090	37,888	490	1.3%	Manhattan CBD
Lexington Av/53 St and 51 St	NYCT	No. 6, and E, M	16,970	17,452	425	2.4%	Manhattan CBD
42 St-Bryant Park-5 Av	NYCT	No. 7, and B, D, F, M	25,587	26,160	369	1.4%	Manhattan CBD
Broadway-Lafayette St and Bleecker St	NYCT	No. 6, and B, D, F, M	27,319	27,990	368	1.3%	Manhattan CBD
Court Square	NYCT	No. 7, and E, G, M	23,503	24,048	354	1.5%	Queens
59 St-Columbus Circle	NYCT	No. 1, and A, B, C, D	38,814	39,552	351	0.9%	Manhattan CBD
Hoboken Terminal (PATH)	PANYNJ	—	8,005	8,345	340	4.2%	New Jersey
Atlantic Av-Barclays Center	NYCT	Nos. 2, 3, 4, 5, and B, Q, D, N, R	37,024	37,710	338	0.9%	Brooklyn
34 St-Herald Sq	NYCT	B, D, F, M, N, Q, R, W	33,021	33,632	344	1.0%	Manhattan CBD
Port Authority Bus Terminal	PANYNJ	—	25,192	25,517	325	1.3%	Manhattan CBD
14 St (Sixth Av/Seventh Av)	NYCT	Nos. 1, 2, 3, and F, M, L	19,476	19,898	288	1.5%	Manhattan CBD
World Trade Center Station	PANYNJ	—	22,469	22,754	285	1.3%	Manhattan CBD
Flushing-Main St	NYCT	7	15,980	16,262	281	1.8%	Queens
Broadway Junction	NYCT	A, C, J, Z	22,013	22,494	264	1.2%	Queens
Canal St	NYCT	No. 6, and N, Q, R, W, J	11,846	12,151	247	2.0%	Manhattan CBD
34 St-Penn Station	NYCT	A, C, E	13,268	13,519	229	1.7%	Manhattan CBD

STATION NAME	OPERATOR	LINE	NO ACTION Ons/Offs	TOLLING SCENARIO E Ons/Offs	NET ONS/OFFS	NET PERCENTAGE CHANGE	LOCATION
168 St-Washington Heights	NYCT	No. 1, and A, C	12,013	12,317	219	1.8%	Manhattan
Newark Penn Station	NJ TRANSIT	—	20,390	20,571	181	0.9%	New Jersey
Newark Penn Station	PANYNJ	—	10,236	10,396	160	2.0%	New Jersey

Source: WSP, Best Practice Model 2021.

Note: All stations with free connections have aggregated volumes. Peak-hour incremental change was calculated as an average 28 percent peak-hour to peak-period ratio in the PM for NYCT subways, PATH trains, and buses; 43 percent peak-hour to peak-period ratio for Metro-North and NJ TRANSIT; and 41 percent peak-hour to peak-period ratio for LIRR. Net ons/offs include subway-to-bus, subway-to-subway, and bus-to-subway transfers and is not a direct calculation of Tolling Scenario E minus No Action Alternative incremental trips.

Figure 4C-7. Transit Stations Identified for Detailed Station Analysis (2023, Tolling Scenario E – Representative Tolling Scenario)



Manhattan CBD (Excluding West Side Highway/ Route 9A and FDR Drive)

Transit Station

Source: WSP, Best Practice Model 2021.

Qualitative Analysis of NYC Stations

Some of the stations with over 200 anticipated new passengers due to the Project have large-scale station improvements either recently constructed, being implemented, or in process, which will significantly change circulation patterns and capacity at these stations. Consultation undertaken with NYCT—which took into account these current and/or future station improvements, as well as station size and available access points, existing usage levels, and baseline data availability—concluded that a qualitative evaluation of the stations below is appropriate as the projected incremental trips, in the context of ongoing improvements, would not have the potential to result in adverse effects. For more information, see the methodology for performing qualitative assessments above in **Section 4C.2.1.1**.

Grand Central Terminal (serving Metro-North) is projected to have a net increase of 619 peak-hour passengers under Tolling Scenario E, which constitutes a 1.4 percent increase in Metro-North ridership at this East Midtown hub (see **Table 4C-27**). Additionally, the **42nd St–Grand Central** subway station is projected to see a net increase of 761 peak-hour passengers under Tolling Scenario E. About two-thirds of these are the Nos. 4/5/6 line passengers, followed by about 30 percent of passengers using the No. 7 train. The remaining 5 percent are passengers using the 42nd Street Shuttle (S).

Several improvements have recently been completed at the Grand Central Terminal commuter rail and subway stations. Over the years, the North End Access project has provided Metro-North commuter rail passengers at Grand Central Terminal with more direct access to destinations north of the Terminal, and additional access points are planned for future development sites. The anticipated completion of the East Side Access project will provide a new LIRR connection to the East Side with a new concourse below the existing Terminal and the new One Vanderbilt development. The 42 Street Connection Project, completed in 2021, has added capacity to several stairs between the terminal and subway and between the subway and street, along with additional turnstiles and platform area serving the 42nd Street Shuttle (S), and modernized the escalators and elevator. Other than the escalator and elevator work, these changes will improve transfer moves, which are the largest portion of the projected increment for these stations, although they will not increase overall capacity. Similarly, the Lexington Avenue line station that is one stop north of Grand Central Station—the Lexington Av/53 St–51 St Station—is expected to undergo substantial improvements as part of the on-going build-out of the Greater East Midtown Rezoning initiatives. This station, which is projected to incur a net increase of 395 peak-hour passengers under Scenario E, spans three city blocks linking two separate station complexes (i.e., 51st St [No. 6 train] and Lexington Av–53 St [E/M trains]).

Accordingly, the projected incremental trips would be dispersed across a large number of station elements, many of which will undergo substantial improvements. Hence, in consultation with NYCT, quantitative analyses of the Grand Central commuter rail terminal and subway station, as well as the Lexington Av–53 St/51st St Station, were determined to be not warranted. Considering the improvements that would be in place and which were designed to improve existing operations and accommodate future growth, the projected increments from the Project, dispersed across this station, would not be expected to have the potential to result in adverse effects.

The **PABT** is projected to see a net increase of 301 passengers in the AM peak hour, which is an increase of 1.3 percent. AM peak period ridership of the PABT was 84,000 in 2015 according to the Continuous Bus Study, roughly 26 percent of which (21,840) occurred during the AM peak hour. Because the projected increments would be distributed across a large transit complex, including a portion captured in the Times Square Station analyses, a quantitative analysis of the bus terminal (which is not expected to show material differences between future no action and with action conditions) was determined to not be warranted. The CBD Tolling Alternative is, hence, not expected to result in adverse effects on circulation elements within this facility.

Under Tolling Scenario E, the **Penn Station New York** (LIRR, NJ TRANSIT, Amtrak) Station is projected to experience a net increase of 1,380 passengers (a 2.2 percent increase) and the **34 St-Penn Station** (Eighth Avenue A, C, E lines) a net increase of 213 passengers (a 1.9 percent increase). The **34 St–Herald Square** Station is projected to see an increase of 319 passengers (a 1.9 percent increase). The 34 St-Penn Station (Seventh Avenue 1, 2, 3 lines) is not projected to experience a net increase of over 200 passengers.

- With respect to Penn Station New York and 34-Penn Station, according to the April 2021 Penn Station Master Plan, https://new.mta.info/document/37416 , daily Penn Station ridership was approximately 600,000 in 2019.[34] Roughly 30 percent of that ridership occurred in the AM peak period (180,000), and 26 percent of AM peak ridership (40,680) occurred during the AM peak hour. Considering the expansiveness of Penn Station New York and its adjacent subway stations, as well as the recently completed Moynihan Station, the incremental pedestrian trips would be dispersed across a myriad of different pedestrian paths and a large number of station circulation elements, and would not be perceptible to those already using the station.
- At 34 St – Herald Square Station, turnstile data shows daily ridership of approximately 250,000 in October 2019.[35] Roughly 30 percent of that ridership occurred in the AM peak period (75,000), and 26 percent of AM peak ridership (19,500) occurred during the AM peak hour. The under 400 incremental passengers would traverse a large network of street-level entrances and underground passageways extending from West 32nd to West 35th Streets across Broadway and Sixth Avenue.
- Accordingly, incremental ridership increases from the Project are unlikely to result in perceptible changes to operations at these transit facilities. Hence, in consultation with NYCT, quantitative analyses of the Penn Station New York commuter rail terminal and the adjacent/adjoining 34th Street subway stations were determined to be not required, and the Project is not expected to result in adverse effects on circulation elements within these facilities.

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34 39 percent LIRR (237,000); 31 percent NJ TRANSIT (187,000); 24 percent subway and others, including local office workers and others patronizing in station retail (142,000) and 6 percent Amtrak (34,000). April 2021 Penn Station Master Plan. https://new.mta.info/document/37416.

35 MTA Turnstile data. http://web.mta.info/developers/turnstile.html.

Fulton Street Station is projected to see an increase of 560 passengers in the AM peak hour, which is a 2.8 percent increase relative to the station's No Action Alternative ridership. The incremental number of passengers among the A/C, Nos. 2/3, and Nos. 4/5 lines are comparable, with the highest projected volumes on the A/C lines. Access to these lines is made via many station entrances spanning several city blocks east–west and north–south. Additionally, all lines within this station are connected via underground passageways; therefore, the projected increments would be well distributed across many station elements, such that the increase in trips at any individual station element is likely to be imperceptible. Moreover, the Fulton Street Transit Center renovations, completed in 2014, which included additional stair capacity off each platform, opening of new entrances, and reconstruction of upper mezzanine areas that improved ease of transfers within the station, provided additional capacity to accommodate future growth in ridership. Accordingly, in consultation with NYCT, a quantitative analysis was determined to be not required, and the Project is not expected to result in adverse effects at this station.

Quantitative Analysis of Stations

For the remaining stations, a quantitative station analysis was conducted at 18 transit stations: 13 NYCT stations, 2 NJ TRANSIT stations, and 3 PATH stations (operated by PANYNJ).

Quantitative Analysis of Transit Stations – NYCT Stations

An analysis of existing AM and PM peak-hour service levels at station elements was prepared to describe the operating conditions of the 13 stations and identify station elements that are already operating near capacity or at congested levels. These study locations were selected in coordination with NYCT. For each station's selected analysis locations, NYCT was consulted on the appropriate application of friction and surge factors and the analyses were prepared in accordance with the guidance presented in the *CEQR Technical Manual*. As summarized in **Table 4C-29 and Table 4C-30**, approximately 15 percent of the station elements (86 in the AM peak hour and 81 in the PM peak hour out of 564 station elements) analyzed for the 13 stations currently operate at or above capacity, at level of service (LOS) D or worse. The detailed analysis results described above are presented in **Appendix 4C-7, "Transportation: Level of Service Tables – New York City" and Appendix 4C-8, "Transportation: Level of Service Tables – NJ TRANSIT and PATH Stations."**

For the No Action Alternative, no additional background growth was applied on top of 2019 ridership levels since the existing condition incorporates a return to pre-COVID-19 pandemic transit ridership. According to an analysis by McKinsey & Company, commissioned by MTA, ridership may reach 80 percent to 92 percent of pre-pandemic levels by end of 2024.[36] As summarized in **Table 4C-31 and Table 4C-32**, approximately 14 percent to 15 percent of the station elements (86 in the AM peak hour and 81 in the PM peak hour out of 563 station elements) analyzed for the 13 stations would operate at or above capacity, at LOS D or worse.

36 MTA 2021 Budget and 2021–2024 Financial Plan Adoption Materials. MTA Finance Committee/MTA Board. December 16, 2020. https://new.mta.info/document/25291.

Table 4C-28. Existing Conditions Level of Service for Analyzed Stations Elements (2019 AM Peak Hour)

STATION	COUNT OF VERTICAL CIRCULATION ELEMENTS				COUNT OF FARE CONTROL AREA ELEMENTS			
	LOS A, B, C	LOS D	LOS E	LOS F	LOS A, B, C	LOS D	LOS E	LOS F
14 St-Union Square	27	9	2	6	12	0	0	0
42 St-Times Square/PABT	51	6	11	4	17	0	0	0
42 St-Bryant Park/Fifth Av	29	4	3	1	9	0	0	0
Bleecker St-Broadway/Lafayette St	28	0	0	1	10	0	0	0
Atlantic Av-Barclays Center	16	1	1	0	8	0	0	0
14 St-Sixth/Seventh Av	59	2	1	1	16	0	0	0
Flushing-Main St	10	4	1	3	3	0	0	0
Canal St (N, Q, R, W, J, Z, 6)	30	2	1	0	9	0	0	0
168 St-Washington Heights	31	0	1	0	4	0	0	0
59 St-Columbus Circle	25	2	0	0	7	0	0	0
Broadway Junction	10	4	1	0	1	0	0	0
Court Square	24	0	2	1	8	0	0	0
Lexington Av/59 St	24	5	2	4	10	0	0	0

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

Table 4C-29. Existing Conditions Level of Service for Analyzed Station Elements (2019 PM Peak Hour)

STATION	COUNT OF VERTICAL CIRCULATION ELEMENTS				COUNT OF FARE CONTROL AREA ELEMENTS			
	LOS A, B, C	LOS D	LOS E	LOS F	LOS A, B, C	LOS D	LOS E	LOS F
14 St-Union Square	27	10	3	4	12	0	0	0
42 St-Times Square/PABT	49	10	10	3	17	0	0	0
42 St-Bryant Park/Fifth Av	31	4	0	2	9	0	0	0
Bleecker St-Broadway/Lafayette St	24	4	0	1	10	0	0	0
Atlantic Av-Barclays Center	13	5	0	0	8	0	0	0
14 St-Sixth/Seventh Av	60	3	0	0	16	0	0	0
Flushing-Main St	13	2	2	1	3	0	0	0
Canal St (N, Q, R, W, J, Z, 6)	31	2	0	0	9	0	0	0
168 St-Washington Heights	31	1	0	0	4	0	0	0
59 St-Columbus Circle	26	1	0	0	7	0	0	0
Broadway Junction	13	2	0	0	1	0	0	0
Court Square	26	1	0	0	8	0	0	0
Lexington Av/59 St	25	4	2	4	10	0	0	0

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

Table 4C-30. No Action Alternative Level of Service for Analyzed Station Elements (2023 AM Peak Hour)

STATION	COUNT OF VERTICAL CIRCULATION ELEMENTS				COUNT OF FARE CONTROL AREA ELEMENTS			
	LOS A, B, C	LOS D	LOS E	LOS F	LOS A, B, C	LOS D	LOS E	LOS F
14 St-Union Square	27	9	2	6	12	0	0	0
42 St-Times Square/PABT	51	6	11	4	16	0	0	0
42 St-Bryant Park/Fifth Av	29	4	3	1	9	0	0	0
Bleecker St-Broadway/Lafayette St	28	0	0	1	10	0	0	0
Atlantic Av-Barclays Center	16	1	1	0	8	0	0	0
14 St-Sixth/Seventh Av	59	2	1	1	16	0	0	0
Flushing-Main St	10	4	1	3	3	0	0	0
Canal St (N, Q, R, W, J, Z, 6)	30	2	1	0	9	0	0	0
168 St-Washington Heights	31	0	1	0	4	0	0	0
59 St-Columbus Circle	25	2	0	0	7	0	0	0
Broadway Junction	10	4	1	0	1	0	0	0
Court Square	24	0	2	1	8	0	0	0
Lexington Av/59 St	24	5	2	4	10	0	0	0

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

Table 4C-31. No Action Alternative Level of Service for Analyzed Station Elements (2023 PM Peak Hour)

STATION	COUNT OF VERTICAL CIRCULATION ELEMENTS				COUNT OF FARE CONTROL AREA ELEMENTS			
	LOS A, B, C	LOS D	LOS E	LOS F	LOS A, B, C	LOS D	LOS E	LOS F
14 St-Union Square	27	10	3	4	12	0	0	0
42 St-Times Square/PABT	49	10	10	3	16	0	0	0
42 St-Bryant Park/Fifth Av	31	4	0	2	9	0	0	0
Bleecker St-Broadway/Lafayette St	24	4	0	1	10	0	0	0
Atlantic Av-Barclays Center	13	5	0	0	8	0	0	0
14 St-Sixth/Seventh Av	60	3	0	0	16	0	0	0
Flushing-Main St	13	2	2	1	3	0	0	0
Canal St (N, Q, R, W, J, Z, 6)	31	2	0	0	9	0	0	0
168 St-Washington Heights	31	1	0	0	4	0	0	0
59 St-Columbus Circle	26	1	0	0	7	0	0	0
Broadway Junction	13	2	0	0	1	0	0	0
Court Square	26	1	0	0	8	0	0	0
Lexington Av/59 St	25	4	2	4	10	0	0	0

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

As described above, the implementation of the Project would result in measurable increases in subway trips at the 13 analyzed subway stations and the analyses presented in this subchapter depict conditions under the representative tolling scenario with the highest level of incremental ridership increases for subway operations. These increments were used in the station trip assignments described above and overlaid onto the station analysis elements for the quantitative analyses. As summarized in **Table 4C-33 and Table 4C-34**, approximately 15 percent to 16 percent of the station elements (88 in the AM peak hour and 85 in the PM peak hour out of 563 station elements) analyzed for the 13 stations would operate at or above capacity, at LOS D or worse, for Tolling Scenario E.

Table 4C-32. CBD Tolling Alternative Level of Service for Analyzed Station Elements (2023 AM Peak Hour)

	COUNT OF VERTICAL CIRCULATION ELEMENTS				COUNT OF FARE CONTROL AREA ELEMENTS			
STATION	LOS A, B, C	LOS D	LOS E	LOS F	LOS A, B, C	LOS D	LOS E	LOS F
14 St-Union Square	26	9	3	6	12	0	0	0
42 St-Times Square/PABT	50	6	11	5	16	0	0	0
42 St-Bryant Park/Fifth Av	29	4	3	1	9	0	0	0
Bleecker St-Broadway/Lafayette St	28	0	1	0	10	0	0	0
Atlantic Av-Barclays Center	16	1	0	1	8	0	0	0
14 St-Sixth/Seventh Av	59	1	2	1	16	0	0	0
Flushing-Main St	10	4	1	3	3	0	0	0
Canal St (N, Q, R, W, J, Z, and No. 6)	30	2	1	0	9	0	0	0
168 St-Washington Heights	31	0	1	0	4	0	0	0
59 St-Columbus Circle	25	2	0	0	7	0	0	0
Broadway Junction	10	4	1	0	1	0	0	0
Court Square	24	0	2	1	8	0	0	0
Lexington Av/59 St	24	5	2	4	10	0	0	0

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

Table 4C-33. CBD Tolling Alternative Level of Service for Analyzed Station Elements (2023 PM Peak Hour)

STATION	COUNT OF VERTICAL CIRCULATION ELEMENTS				COUNT OF FARE CONTROL AREA ELEMENTS			
	LOS A, B, C	LOS D	LOS E	LOS F	LOS A, B, C	LOS D	LOS E	LOS F
14 St-Union Square	27	9	4	4	12	0	0	0
42 St-Times Square/PABT	48	10	10	4	16	0	0	0
42 St-Bryant Park/Fifth Av	31	4	0	2	9	0	0	0
Bleecker St-Broadway/Lafayette St	24	4	0	1	10	0	0	0
Atlantic Av-Barclays Center	13	5	0	0	8	0	0	0
14 St-Sixth/Seventh Av	60	2	1	0	16	0	0	0
Flushing-Main St	12	3	2	1	3	0	0	0
Canal St (N, Q, R, W, J, Z, and No. 6)	31	2	0	0	9	0	0	0
168 St-Washington Heights	31	1	0	0	4	0	0	0
59 St-Columbus Circle	26	1	0	0	7	0	0	0
Broadway Junction	13	2	0	0	1	0	0	0
Court Square	25	1	1	0	8	0	0	0
Lexington Av/59 St	24	4	3	4	10	0	0	0

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

Based on criteria prescribed in the *CEQR Technical Manual*, without Project improvements, potential adverse effects were predicted at 4 VCEs and no FCAs across the 13 analyzed stations for the representative tolling scenario (**Table 4C-35**). Comparing projected ridership increases across various tolling scenarios, it is anticipated that some tolling scenarios may have relatively less potential for potential adverse effects (further described below). At stations where adverse effects are anticipated monitoring will be undertaken and the following mitigation measures will be pursued should they be needed:

- Times Square Station (PM only)
  - *VCE:* Interborough Rapid Transit (IRT) Mezzanine Level (ML) Stair 6/8 (Stair ML6/ML8) – stairway connecting IRT mezzanine to uptown Nos. 1, 2, 3 subway platform. The adverse effects identified for the Stair ML6/ML8 will be avoided or relieved by removing the center handrail and standardizing the riser, so that the stair meets code without the handrail. (NYCT has confirmed code compliance.) Implementing this mitigation measure will improve the PM peak-hour conditions from LOS F (with a v/c ratio of 1.70) to LOS E (with a v/c ratio of 1.64) and avoid the predicted potential adverse effect. Upon monitoring and evaluation of ridership at this station, TBTA will coordinate with MTA to construct this improvement if the projected ridership materializes.

Table 4C-34. NYCT Station Elements Where Adverse Effects and Accompanying Project Improvements Have Been Identified (CBD Tolling Alternative, 2023 AM/PM Peak Hour)

STATION	ELEMENT	ELEMENT DESCRIPTION	PEA HOUR OF CONCERN	NO ACTION ALTERNATIVE			CBD TOLLING ALTERNATIVE			IDENTIFIED IMPROVEMENT
				Peak-Hour Volume	V/C Ratio	Level of Service	Peak-Hour Volume	V/C Ratio	Level of Service	
42 St-Times Sq/PABT	IRT ML6/ML8	Stairway connecting IRT mezzanine to uptown Nos. 1, 2, and 3 subway platform	PM	4,680	1.65	E	3,802	1.70	F	Remove center hand rail and standardize the riser.
Flushing – Main St	E456	Street escalator at north side of Roosevelt Avenue between Main Street and Union Street	AM	2,984	1.18	D	3,040	1.21	D	Increase escalator speed to 120 feet per minute.
Union Sq	E219	Escalator connecting the Canarsie line platform to the IRT mezzanine	AM	2,496	1.26	D	2,519	1.27	D	Increase escalator speed to 120 feet per minute.
Court Sq	Flushing P2/P4	Stair between paid zone and Manhattan-bound No. 7 train	AM	3,825	1.84	F	3,955	1.90	F	Construct new stair from the northern end of the No. 7 platform to the street.

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

- **Flushing-Main Street Station (AM only)**
  - VCE: Escalator 456 (E456) – located on the east side of the station providing access from the street to the mezzanine. The E456 escalator, which was replaced and operates at a speed of 100 feet per minute (fpm), can be safely operated at 120 fpm. (NYCT has confirmed code compliance). Without the improvement, this escalator would operate at LOS D (with a v/c ratio of 1.21). Implementing this operational change will improve the forecast AM peak-hour condition) to LOS D (with a v/c ratio of 1.08) and avoid the predicted potential adverse effect. Upon monitoring and evaluation of ridership at this station, TBTA will coordinate with MTA to implement this improvement if the projected ridership materializes.
- **14 St - Union Square Station (AM only)**
  - VCE: Escalator 219 (E219) – connecting the Canarsie line platform to the IRT mezzanine. The E219 escalator, which was installed in 2020 and operates at a speed of 100 fpm, can be safely operated at 120 fpm. (NYCT has confirmed code compliance). Without the improvement, this escalator would operate at LOS D (with a v/c ratio of 1.27). With the implementation of this operational change, the forecast AM peak-hour condition will be improved to LOS D (with a ratio of 1.15) and avoid the predicted potential adverse effect. Upon monitoring and evaluation of ridership at this station, TBTA will coordinate with MTA to implement this improvement if the projected ridership materializes.
- **Court Square Station (AM only)**
  - VCE: Flushing Platform Stair 2/4 (Stair P2/P4) Stair – accessing Manhattan-bound No. 7 train. The adverse effects identified for this stairway will be mitigated by building a new stair from the northern end of the No. 7 platform to the street, along with a new fare control area. Doing so will distribute pedestrian flow away from Stair P2/P4. Implementation of this mitigation measure would improve the AM peak-hour conditions from LOS F, with a v/c ratio of 1.90, to LOS E, with a v/c ratio of 1.56 and avoid the predicted potential adverse effect. The improvement (the new stair and fare control area) is listed in the Special Long Island City Mixed Use District, Court Square Subdistrict, administered by the New York City Department of City Planning (NYCDCP). The Subdistrict language assigns transit improvement projects to projected developments on three blocks—this improvement is tied to a site on the southernmost block, which is on the east side of 23rd Street between 45th Road and 45th Avenue, Queens, New York. NYCT maintains ongoing coordination with NYCDCP about potential qualifying developments within the Subdistrict, and MTA approval for the design of the subway improvement and certification by the Chairperson of the City Planning Commission are both required. Thus, it is possible that this mitigation will be built by an outside developer in coordination with NYCT before the impact occurs. Upon monitoring of ridership at this station, if the projected ridership is anticipated to materialize and this station improvement has not been constructed via outside developers, or if construction by an outside developer is not likely in the foreseeable future from when the impact is triggered, TBTA will coordinate with NYCT to construct this new stair. The monitoring plan will allow for sufficient time to implement the mitigation to ensure that the adverse effect does not occur.

Implementation of the potential stairway and escalator improvements at 42nd Street-Times Square/PABT, Main Street-Flushing, Court Square, and 14th Street-Union Square Stations have been reviewed by NYCT for feasibility and will be further coordinated and finalized through NYCT, in compliance with requirements under the Americans with Disabilities Act.

In contrasting the projected increases in passenger volumes among the various tolling scenarios, it can be expected that Tolling Scenarios D and F would yield the same or comparable adverse effects that could be addressed with the same Project improvements identified for the representative tolling scenario. While these adverse effects and need for Project improvements may also materialize for Tolling Scenarios A, B, C, and G, the severity of the adverse effects and extent of Project improvements needed is likely to be relatively less than the other three tolling scenarios (D, E, and F) and varies by station element as a function of projected net passenger increase at the station. Nevertheless, to ensure the Project does not create an adverse effect at any of the four NYCT station elements described above, monitoring at all four NYCT station elements will be undertaken regardless of the tolling scenario selected. Monitoring of actual conditions before and after Project implementation will determine if the potential Project mitigation measures identified are warranted for implementation.

The operating agencies will monitor changes in ***[passenger volumes at the specific station elements in]*** the first year after implementation of the Project. The changes in ***[passenger volumes]*** will be used in accordance with the thresholds defined by the *CEQR Technical Manual* to determine whether forecast adverse effects at specific station elements would materialize and whether improvement strategies—which, if implemented, would achieve an adequate level of improvement to avoid the predicted adverse effects—should be pursued.

[Design and resource allocation will begin immediately after the passenger volume threshold is exceeded (or if already exceeded, as soon as practicable), and the mitigation measures will be implemented prior to overall ridership at the station exceeding 90 percent of 2019 levels.] Because some of these strategies are likely to require additional planning, design, and construction, it is possible that short-term, adverse effects may occur while these improvements are being designed and constructed. The operating agencies will also advance planning and design efforts subsequent to approval of the Project to expedite the implementation of improvement strategies if they are deemed warranted by the above monitoring efforts.

<u>Detailed Analysis of Transit Stations – NJ TRANSIT Stations</u>
Analyses of stations for NJ TRANSIT were performed using CEQR guidelines for consistency and because NJ TRANSIT does not have an alternative guideline. Two NJ TRANSIT stations, Secaucus Junction and Hoboken Terminal, would meet the CEQR criteria for detailed analysis with 200 or more Project-generated trips in a peak hour with Tolling Scenario E, the representative tolling scenario for transit analyses. In addition, Newark Penn Station would experience an increase of more than 200 peak-hour trips with Tolling Scenario C.

At Hoboken Terminal and Newark, the connected PATH stations would also experience increases of more than 200 peak-hour trips, and in those cases, most of the increase consists of transfers between NJ TRANSIT rail and PATH trains.

NJ TRANSIT trains at Hoboken Terminal are distributed to 17 tracks which are accessed via nine at-grade platforms. The platforms are accessed directly from an at-grade concourse at the south end of the tracks and at-grade platforms without any requirement for vertical circulation. Therefore, NJ TRANSIT areas of the station do not contain many capacity constrained pedestrian elements (such as stairs or escalators). As Project-generated passengers would be widely dispersed in the terminal and there are no VCEs in the NJ TRANSIT area, no further analysis was performed for the NJ TRANSIT areas of Hoboken Terminal. (Analysis of PATH station elements at Hoboken Terminal is discussed below.)

For the Secaucus Junction and Newark Penn Station, Project-generated incremental pedestrian volumes were assigned to VCEs along likely paths of travel. Detailed analysis was conducted for elements that are projected to see an increase of 100 or more people in the AM or PM peak hour, because it was deemed unlikely that elements with smaller incremental increases would experience an adverse effect from the Project. This threshold was borne out by the analysis because the elements that exceeded the 100-person threshold also did not experience significant adverse effects.

BPM model outputs indicate that most Project-generated trips at Secaucus Junction would be transferring from eastbound Main Line trains to eastbound Northeast Corridor trains in the morning and the reverse direction in the evening, with a small number also transferring between buses and Northeast Corridor trains. While passengers making these connections are distributed to multiple stairs and escalators, there would be a concentration of activity on the three escalators to the platform serving Northeast Corridor Tracks A and B just north of the fare control area at the mezzanine level. Analysis was also conducted for the next set of stairs and escalators to Tracks 2, A, B, and 3 north of the fare control area.

At Newark Penn Station, most Project-generated trips would be transferring from eastbound NJ TRANSIT trains to eastbound PATH trains in the morning and the reverse direction in the evening. In the morning, these transfers would be primarily cross-platform from Tracks 1 and 2 to the eastbound PATH platform without using any vertical circulation. The small number who would transfer from Track A to PATH would use vertical circulation but would result in very small incremental volumes on those elements. During the evening, most Project-generated trips would transfer from the arriving PATH platform H down a ramp to the platform serving Tracks 3 and 4. A smaller number of passengers would transfer down another ramp to the platform serving Track 5. An analysis was conducted of the ramp to Platforms 3 and 4 in the PM peak period only.

For the No Action Alternative, no growth factor was applied because the baseline conditions incorporate a return to pre-COVID-19 pandemic transit ridership. Therefore, levels of service are the same in the existing condition and No Action Alternative.

The LOS on the ramp analyzed at Newark Penn Station (T**able 4C-36**), would continue to operate at LOS A with the Project. Of the eight elements analyzed at Secaucus Junction, one escalator and one stair would decline from LOS A to LOS C with the proposed action. However, based on criteria prescribed in the *CEQR Technical Manual*, no significant adverse effects were predicted at the NJ TRANSIT stations.

Table 4C-35. Level of Service on NJ TRANSIT Station Elements (Peak Hour)

STATION/ELEMENT	EXISTING (2019)		NO ACTION ALTERNATIVE (2023)		CBD TOLLING ALTERNATIVE (2023)	
	AM	PM	AM	PM	AM	PM
Newark, Ramp to Tracks 3 and 4	N/A	A	N/A	A	N/A	A
Secaucus, Escalator 1a to Platform A/B	A	A	A	A	B	A
Secaucus, Escalator 1b to Platform A/B	A	A	A	A	C	A
Secaucus, Escalator 1c to Platform A/B	B	A	B	A	B	A
Secaucus, Stair 2a to Platform 3	A	N/A	A	N/A	A	N/A
Secaucus, Escalator 2b to Platform 3	A	N/A	A	N/A	A	N/A
Secaucus, Stair 3 to Platform A/B	A	A	A	A	C	C
Secaucus, Stair 4a to Platform 2	N/A	A	N/A	A	N/A	A
Secaucus, Escalator 4b to Platform 2	N/A	A	N/A	A	N/A	A

Source: Analysis prepared by AKRF, FHI Studio, and WSP.
Note: N/A = Not applicable

Detailed Analysis of Transit Station – PATH Stations

Analyses of stations for PATH were performed using CEQR guidelines for consistency and because PANYNJ does not have an alternative guideline. Three PATH stations—World Trade Center, Newark Penn Station, and Hoboken Terminal—would meet the CEQR criteria for detailed analysis with 200 or more Project-generated trips in a peak hour with Tolling Scenario E. At Hoboken and Newark, most of the Project-generated increase consists of transfers between PATH and NJ TRANSIT trains.

The PATH World Trade Center Station consists of five tracks accessed from four platforms. Each of the platforms is accessed by multiple stairs and escalators in relatively close proximity. Distribution of Project-generated passengers to the various elements results in low incremental volumes on each element. Due to the number of platforms and circulation elements, no individual circulation element would receive more than 100 new trips in a peak hour. Based on distribution and low incremental volumes added to individual elements, more detailed analysis was not performed for circulation elements in the station.

At Newark Penn Station, originating PATH trains depart eastbound on a track that is at the same level as the NJ TRANSIT rail tracks. Departing trains are accessible from platforms on both sides of this track, which are directly accessible from the platforms serving NJ TRANSIT Tracks 1 and 2. PATH trains arrive and terminate westbound at a track on the upper level. Access to both PATH platforms is provided via stairs, escalators, and two ramps that are in the NJ TRANSIT controlled areas of the station and were addressed by the analysis for those areas, described above.

The PATH Hoboken Station is connected to the Hoboken Terminal NJ TRANSIT trains by two stairs located within the Terminal building and two smaller stairs located just outside the north wall of the Terminal. Most passengers transferring between PATH and NJ TRANSIT use the two inside stairs due to their larger size and visibility from within the terminal or the PATH station. The PATH station also has two stairs on the north side of the station providing access to Hudson Place and the Hoboken community.

Project-generated trips were assigned to the two key stairs providing connection to Hoboken Terminal, street stairs serving the community, and additional stairs that connect a mezzanine level to each of the

three platforms. Although only Stair 01/02, connecting the PATH station to Hoboken Terminal, would experience more than 100 Project-generated trips during either peak hour, a detailed analysis was performed both for that Stair 01/02 and Stair 05, which also connects to the terminal. **Table 4C-37** indicates existing, No Action Alternative, and CBD Tolling Alternative LOS on the two stairs analyzed at the PATH Hoboken Station.

Table 4C-36. Level of Service on PATH Hoboken Station Elements (AM and PM Peak Hours)

STATION/ELEMENT	EXISTING (2019)		NO ACTION ALTERNATIVE (2023)		CBD TOLLING ALTERNATIVE (2023)	
	AM	PM	AM	PM	AM	PM
Hoboken Stair 01/02	LOS D	LOS D	LOS D	LOS D	LOS E	LOS D
Hoboken Stair 05	LOS A	LOS A	LOS A	LOS A	LOS A	LOS A

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

The implementation of the Project would result in measurable increases in volumes on the various stairs at the PATH Hoboken Station with the representative tolling scenarios. Based on criteria prescribed in the *CEQR Technical Manual*, an adverse effect was predicted during the AM peak hour at Stair 01/02 for Tolling Scenario E, the tolling scenario with the highest projected ridership.

In contrasting the projected increases in passenger volumes among the various tolling scenarios, there could be considerable differences in the projected passenger increases, which could lead to potential adverse effects (**Table 4C-38**). While Tolling Scenarios E and F (the tolling scenarios with the highest tolls) would yield the passenger increases sufficient to result in adverse effects, Tolling Scenarios A, B, C, D, and G are not predicted to result in adverse effects in this location.

Table 4C-37. Projected Net Passenger Increase at Hoboken Stair 01/02 (All Scenarios, AM Peak Hour)

	TOLLING SCENARIO A	TOLLING SCENARIO B	TOLLING SCENARIO C	TOLLING SCENARIO D	TOLLING SCENARIO E	TOLLING SCENARIO F	TOLLING SCENARIO G
Projected Passenger Increase	45	72	122	164	240	205	139
Determin-ation of Adverse Effect	None	None	None	None	Likely	Likely	None

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

If Tolling Scenario E or F is selected by the TBTA Board, the Project Sponsors will monitor ridership at this station *[two months]* after Project implementation to evaluate whether projected ridership has materialized due to the Project. The specific plan for monitoring is being developed in coordination with PANYNJ (PATH) and NJ TRANSIT. As outlined in the plan, if a comparison of Stair 01/02 passenger volumes one month prior and two months after implementation shows an incremental change that is greater than or equal to 205 passengers, the Project Sponsors will continue coordination with PANYNJ (PATH) and NJ TRANSIT to implement improved wayfinding and supplemental temporary personnel to direct passengers if needed. These mitigation measures are expected to improve circulation and more evenly

distribute passengers among the station's stairs, including PATH Stairs 03 and 05. Through consultation and in coordination with NJ TRANSIT and PANYNJ (PATH), if it is determined that the predicted adverse effects on Stair 01/02 would materialize, the committed improvements will be implemented to alleviate the adverse effect.

4C.5 CONCLUSION

Ridership increases resulting from the Project would affect a limited number of subway lines and subway stations within the regional transit system (and no bus or commuter rail lines or stations). Even in the tolling scenarios with the highest incremental ridership increases, the increases in ridership on the transit lines (line-haul capacity) would not be high enough to be considered adverse effects.

The station screening analysis resulted in some forecast increases of over 200 passengers in MTA subway stations and commuter rail hubs connecting to the Manhattan CBD, but most subway stations and all other commuter rail stations are projected to see relatively small increases. Based on criteria prescribed in the *CEQR Technical Manual*, without Project improvements, potential adverse effects were predicted at 4 VCEs and no FCAs across the 13 analyzed NYCT stations; and at 1 VCE and no FCAs across the 4 analyzed NJ TRANSIT and PATH stations for Tolling Scenario E. These are further described in **Table 4C-39**, along with accompanying project improvements ***[and Table 4C-40 summarizes how mitigation measures will be implemented by the Project Sponsors]***.

Improvements that could alleviate the predicted potential adverse effects include increasing escalator speeds, adding additional wayfinding to distribute passengers, and stair improvements, depending upon location. With the implementation of these improvements, the adverse effects would be ameliorated. In the case of the predicted adverse effect in New Jersey under certain tolling scenarios, planned improvements have been coordinated with NJ TRANSIT and PANYNJ (PATH); coordination will continue for a detailed monitoring program and implementation of improvements, should they be warranted.

Contrasting the projected increases in passenger volumes among the various tolling scenarios, Tolling Scenarios D and F are expected to yield the same or comparable adverse effects that could be addressed with the same Project improvements that are identified for Tolling Scenario E, the representative tolling scenario with the highest incremental ridership increases. While these adverse effects and need for Project improvements may also materialize for Tolling Scenarios A, B, C, and G, the severity of the adverse effects and extent of Project improvements needed may not be needed or may be less than for Tolling Scenario E, depending upon the location.

In consideration of reduced ridership on the subway due to the COVID-19 pandemic, TBTA and the other sponsoring agencies have committed to monitoring before and after Project implementation at the select locations at which adverse effects are predicted under the analyzed tolling scenario. If ridership at those station elements increases (in comparison to pre-implementation ridership) at or above the level anticipated, the Project Sponsors will implement the mitigation measures described above. Because strategies at two NYCT VCEs may require additional planning, design, and construction, the operating agencies will advance planning and design efforts subsequent to approval of the Project to expedite the implementation of improvement strategies if they are warranted by the above monitoring efforts. Short-term, adverse effects may temporarily occur during this construction or implementation process.

Table 4C-38. Summary of Effects of the CBD Tolling Alternative on Transit

<table>
<tr><th rowspan="2">TOPIC</th><th rowspan="2">SUMMARY OF EFFECTS</th><th rowspan="2">LOCATION</th><th rowspan="2">DATA SHOWN IN TABLE</th><th colspan="7">TOLLING SCENARIO</th><th rowspan="2">POTENTIAL ADVERSE EFFECT</th><th rowspan="2">MITIGATION AND ENHANCEMENTS</th></tr>
<tr><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th><th>G</th></tr>
<tr><td rowspan="10">Transit Systems</td><td rowspan="10">• The Project would generate a dedicated revenue source for investment in the transit system.
• Transit ridership would increase by 1 to 2 percent systemwide for travel to and from the Manhattan CBD, because some people would shift to transit rather than driving. Increases in transit ridership would not result in adverse effects on line-haul capacity on any transit routes.</td><td>New York City Transit</td><td rowspan="10">% Increase or decrease in total daily transit ridership systemwide</td><td colspan="7">1.5%–2.1%</td><td rowspan="10">No</td><td rowspan="10">No mitigation needed. No adverse effects</td></tr>
<tr><td>PATH</td><td colspan="7">0.8%–2.0%</td></tr>
<tr><td>Long Island Rail Road</td><td colspan="7">0.6%–2.0%</td></tr>
<tr><td>Metro-North Railroad</td><td colspan="7">0.6%–1.9%</td></tr>
<tr><td>NJ TRANSIT Commuter Rail</td><td colspan="7">0.3%–2.3%</td></tr>
<tr><td>MTA/NYCT Buses</td><td colspan="7">1.3%–1.6%</td></tr>
<tr><td>NJ TRANSIT Bus</td><td colspan="7">0.5%–1.1%</td></tr>
<tr><td>Other buses (suburban and private operators)</td><td colspan="7">0.0%–0.9%</td></tr>
<tr><td>Ferries (Staten Island Ferry, NYC Ferry, NY Waterway, Seastreak)</td><td colspan="7">2.5%–3.5%</td></tr>
<tr><td>Roosevelt Island Tram</td><td colspan="7">1.7%–4.1%</td></tr>
<tr><td rowspan="9">Bus System Effects</td><td rowspan="9">Decreases in traffic volumes within the Manhattan CBD and near the 60th Street boundary of the Manhattan CBD would reduce the roadway congestion that adversely affects bus operations, facilitating more reliable, faster bus trips.</td><td>Manhattan local buses</td><td rowspan="9">% Increase or decrease at maximum passenger load point</td><td colspan="7">Increases of 0.5%–1.2%</td><td rowspan="9">No</td><td rowspan="9">No mitigation needed. No adverse effects</td></tr>
<tr><td>Bronx express buses</td><td colspan="7">-1.6% to 2.2%</td></tr>
<tr><td>Queens local and express buses (via Ed Koch Queensboro Bridge)</td><td colspan="7">2.0%–2.8%</td></tr>
<tr><td>Queens express buses (via Queens-Midtown Tunnel)</td><td colspan="7">-1.3% to 4.1%</td></tr>
<tr><td>Brooklyn local and express buses</td><td colspan="7">1.3%–2.6%</td></tr>
<tr><td>Staten Island express routes (via Brooklyn)</td><td colspan="7">3.7%–4.5%</td></tr>
<tr><td>Staten Island express routes (via NJ)</td><td colspan="7">1.0%–2.8%</td></tr>
<tr><td>NJ/West of Hudson buses (via Holland Tunnel)</td><td colspan="7">- 1.4% to 1.4%</td></tr>
<tr><td>NJ/West of Hudson buses (via Lincoln Tunnel)</td><td colspan="7">0.4%–1.5%</td></tr>
</table>

TOPIC	SUMMARY OF EFFECTS	LOCATION	DATA SHOWN IN TABLE	TOLLING SCENARIO							POTENTIAL ADVERSE EFFECT	MITIGATION AND ENHANCEMENTS
				A	B	C	D	E	F	G		
Transit Elements	Increased ridership would affect passenger flows with the potential for adverse effects at certain vertical circulation elements (i.e., stairs and escalators) in five transit stations: • Hoboken Terminal, Hoboken, NJ PATH station • Times Sq-42 St/42 St-Port Authority Bus Terminal subway station in the Manhattan CBD (N, Q, R, W, and S; Nos. 1, 2, 3, and 7; and A, C, E lines) • Flushing-Main St subway station, Queens (No. 7 line) • 14th Street-Union Square subway station in the Manhattan CBD (Nos. 4, 5, and 6; and L, N, Q, R, W lines) • Court Square subway station, Queens (No. 7 and E, G, M lines)	Hoboken Terminal–PATH station (NJ) Stair 01/02	Net passenger increases or decreases at stair in the peak hour	45	72	122	164	240	205	139	Yes	Mitigation needed for Tolling Scenarios E and F. TBTA will coordinate with NJ TRANSIT and PANYNJ to monitor pedestrian volumes on Stair 01/02 one month prior to commencing tolling operations to establish a baseline, and two months after Project operations begin. If a comparison of Stair 01/02 passenger volumes before and after implementation shows an incremental change that is greater than or equal to 205, then TBTA will coordinate with NJ TRANSIT and PANYNJ to implement improved signage and wayfinding to divert some people from Stair 01/02, and supplemental personnel if needed.
		42 St-Times Square–subway station (Manhattan) Stair ML6/ML8 connecting mezzanine to uptown 1/2/3 lines subway platform	Relative increase or decrease in passenger volumes at station OVERALL as compared to Tolling Scenario E (not only at the affected stair or location) in the peak hour, peak period	63%	59%	68%	82%	100%	82%	56%	Yes	Mitigation needed. TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, TBTA will coordinate with MTA NYCT to remove the center handrail and standardize the riser, so that the stair meets code without the hand rail. The threshold will be set to allow for sufficient time to implement the mitigation so that the adverse effect does not occur.
		Flushing-Main St subway station (Queens)–Escalator E456 connecting street to mezzanine level	Relative increase or decrease in passenger volumes at station OVERALL as compared to Tolling Scenario E (not only at the affected stair or location) in the peak hour, peak period	116%	91%	108%	116%	100%	133%	72%	Yes	Mitigation needed. TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, MTA NYCT will increase the speed from 100 feet per minute (fpm) to 120 fpm.
		Union Sq subway station (Manhattan)–Escalator E219 connecting the L subway line platform to the Nos. 4/5/6 line mezzanine	Relative increase or decrease in passenger volumes at station OVERALL as compared to Tolling Scenario E (not only at the affected stair or location) in the peak hour, peak period	63%	82%	87%	102%	100%	95%	61%	Yes	Mitigation needed. TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, MTA NYCT will increase the escalator speed from 100 fpm to 120 fpm.
		Court Sq subway station (Queens)–Stair P2/P4 to Manhattan-bound No. 7 line	Relative increase or decrease in passenger volumes at station OVERALL as compared to Tolling Scenario E (not only at the affected stair or location) in the peak hour, peak period	98%	90%	102%	104%	100%	117%	97%	Yes	Mitigation needed. TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, TBTA will coordinate with MTA NYCT to construct a new stair from the northern end of the No. 7 platform to the street. The threshold will be set to allow for sufficient time to implement the mitigation so that the adverse effect does not occur.

Table 4C-40. *[Summary of the CBD Tolling Alternative Implementation Approach for Mitigation and Enhancement Measures for Transit]*

RELEVANT LOCATION(S)	DESCRIPTION OF MITIGATION	TIMELINE FOR PRE- AND POST-PROJECT IMPLEMENTATION DATA COLLECTION FOR SPECIFIC MEASURES	THRESHOLD FOR DETERMINING WHEN NEXT STEP(S) WILL BE IMPLEMENTED	TIMING FOR SPECIFIC MEASURES	LEAD AGENCY
Hoboken Terminal–PATH station (NJ) Stair 01/02	TBTA will coordinate with NJ TRANSIT and PANYNJ to monitor pedestrian volumes on Stair 01/02 one month prior to commencing tolling operations to establish a baseline, and two months after Project operations begin. If a comparison of Stair 01/02 passenger volumes before and after Project implementation shows an incremental change that is greater than or equal to 205, then TBTA will coordinate with NJ TRANSIT and PANYNJ to implement improved signage and wayfinding to divert some people from Stair 01/02, and supplemental personnel if needed.	For stair passenger volumes, baseline data will be collected one month prior to commencing tolling operations to establish a baseline, and two months after Project operations begin. Station ridership data is collected and evaluated in an ongoing manner by NJ TRANSIT and PANYNJ.	For signage, if a comparison of Stair 01/02 peak-hour passenger volumes before and after Project implementation shows an incremental change that is greater than or equal to 205. For supplemental personnel, if the threshold for signage has been reached but signage has not yet been installed, and overall ridership at Hoboken Terminal is 90 percent of 2019 levels 30 days prior to commencing tolling operations.	The monitoring plan will be agreed to by TBTA, PANYNJ, and NJ TRANSIT prior to a decision document being issued and MOU will be drafted thereafter. The MOU will be executed within 120 days after toll rates are set. Signage design will commence after the MOU is executed. Signage fabrication and installation will begin immediately after observing passenger volumes in excess of the threshold for next steps. Supplemental personnel, if needed, will be stationed within 45 days after observing passenger volumes in excess of the threshold for next steps. Supplemental personnel will be used until signage is fabricated and installed.	TBTA will lead and coordinate with NJ TRANSIT and PANYNJ.
42 St-Times Square subway station (Manhattan) Stair ML6/ML8 connecting mezzanine to uptown 1/2/3 lines subway platform	TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, TBTA will coordinate with MTA NYCT to remove the center handrail and standardize the riser, so that the stair meets code without the hand rail. The threshold will be set to allow for sufficient time to implement the mitigation so that the adverse effect does not occur.	Exact timing will be based on seasonality and other factors such as service changes and construction activity in the station. For stair passenger volumes, baseline data will be collected within the six months prior to Project implementation. Post-implementation data will be collected within the first year after Project implementation. Station ridership data is collected and evaluated in an ongoing manner by MTA NYCT based on turnstile entry and exit data throughout the system.	If a comparison of Stair ML6/ML8 peak hour weekday passenger volumes before and after Project implementation shows an incremental change that is greater than or equal to 92 passengers in the weekday peak hour, and overall ridership at 42 St-Times Square subway station exceeds 90 percent of 2019 levels. The methods of data collection and evaluation will follow standard practices pursuant to guidelines of the CE R echnical Manual and will be coordinated with NYCT.	Design and resource allocation will begin immediately after the passenger volume threshold is exceeded, and the hand rail will be removed prior to overall ridership at the station exceeding 90 percent of 2019 levels.	TBTA will lead in partnership MTA NYCT.
Flushing-Main St subway station (Queens)–Escalator E456 connecting street to mezzanine level	TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, MTA NYCT will increase the speed from 100 feet per minute (fpm) to 120 fpm.	Exact timing will be based on seasonality and other factors such as service changes and construction activity in the station. For escalator passenger volumes, baseline data will be collected within the six months prior to Project implementation. Post-implementation data will be collected within the first year after Project implementation.	If a comparison of Escalator E456 peak hour weekday passenger volumes before and after Project implementation shows an incremental change that is greater than or equal to 26 passengers in the weekday peak hour, and overall ridership at Flushing-Main St subway station exceeds 90 percent of 2019 levels. The methods of data collection and evaluation will follow standard practices pursuant to guidelines of the CE R echnical Manual and will be coordinated with NYCT.	Prior to overall ridership at the station exceeding 90 percent of 2019 levels.	TBTA will lead in partnership MTA NYCT.
Union Sq subway station (Manhattan)–Escalator E219 connecting the L subway line platform to the Nos. 4/5/6 line mezzanine	TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, MTA NYCT will increase the escalator speed from 100 fpm to 120 fpm.	Exact timing will be based on seasonality and other factors such as service changes and construction activity in the station. For escalator passenger volumes, baseline data will be collected within the six months prior to Project implementation. Post-implementation data will be collected within the first year after Project implementation. Station ridership data is collected and evaluated in an ongoing manner by MTA NYCT based on turnstile entry and exit data throughout the system.	If a comparison of Escalator E219 peak hour weekday passenger volumes before and after Project implementation shows an incremental change that is greater than or equal to 21 passengers in the weekday peak hour, and overall ridership at Union Sq subway station exceeds 90 percent of 2019 levels. The methods of data collection and evaluation will follow standard practices pursuant to guidelines of the CE R echnical Manual and will be coordinated with NYCT.	Prior to overall ridership at the station exceeding 90 percent of 2019 levels.	TBTA will lead in partnership MTA NYCT.

RELEVANT LOCATION(S)	DESCRIPTION OF MITIGATION	TIMELINE FOR PRE- AND POST PROJECT IMPLEMENTATION DATA COLLECTION FOR SPECIFIC MEASURES	THRESHOLD FOR DETERMINING WHEN NEXT STEP(S) WILL BE IMPLEMENTED	TIMING FOR SPECIFIC MEASURES	LEAD AGENCY
Court Sq subway station (Queens)–Stair P2/P4 to Manhattan-bound No. 7 line	TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, TBTA will coordinate with MTA NYCT to construct a new stair from the northern end of the No. 7 platform to the street. The threshold will be set to allow for sufficient time to implement the mitigation so that the adverse effect does not occur.	Exact timing will be based on seasonality and other factors such as service changes and construction activity in the station. For stair passenger volumes, baseline data will be collected within the six months prior to Project implementation. Post-implementation data will be collected within the first year after Project implementation. Station ridership data is collected and evaluated in an ongoing manner by MTA NYCT based on turnstile entry and exit data throughout the system.	If a comparison of Stair P2/P4 peak hour weekday passenger volumes before and after Project implementation shows an incremental change that is greater than or equal to 101 passengers in the weekday peak hour, and overall ridership at Court Sq subway station exceeds 90 percent of 2019 levels, and if construction by an outside developer is not likely in the foreseeable future. The methods of data collection and evaluation will follow standard practices pursuant to guidelines of the CE R echnical Manual and will be coordinated with NYCT.	Design and resource allocation will begin immediately after the passenger volume threshold is exceeded and will be implemented prior to overall ridership at the station exceeding 90 percent of 2019 levels (if construction by an outside developer is not likely in the foreseeable future).	TBTA will lead in partnership MTA NYCT.

4D. Parking

4D.1 INTRODUCTION

This subchapter describes the potential effects of implementing the CBD Tolling Alternative on parking, including curbside parking (on-street parking) and parking lots and garages (off-street parking) in the regional study area for the Project. The analysis to determine potential effects includes assessments of commuter parking demand on on-street parking and off-street parking, where present; at commuter and intercity rail stations providing service along routes terminating at or near the Manhattan CBD; and at bus facilities, light-rail and subway facilities, ferry facilities, and a tramway facility in the 28-county regional study area. Separately, in New York City outside the Manhattan CBD and in the Manhattan CBD, general parking utilization and availability as well as the potential demand associated with the Project are described. This subchapter considers the Project's potential increase in demand to determine whether the Project could lead to shortfalls in parking supply.[1]

4D.2 METHODOLOGY

The analysis of the potential effects of the Project on parking conditions considered locations where transportation modeling predicts an increase in vehicle trips that would result from the Project (see **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling"**).

Consistent with the other analyses in this EA, the parking analysis was conducted using data collected prior to the COVID-19 pandemic. The analysis employs the methodologies outlined in the City of New York's *CEQR Technical Manual*.[2]

The *CEQR Technical Manual* recommends a tiered approach to evaluating a project's effects on parking demand and supply based on the vehicular trips generated by a project in total, and then at individual intersections. The first step in the tiered analysis is to determine whether a project could result in 50 or more additional vehicle trips during the peak hour in total. If surpassed, the second step in the tiered analysis is to determine whether a project could result in 50 or more additional vehicle trips during the

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1 In addition, post-implementation, the Project's effects on parking supply and demand in New York City in and around the Manhattan CBD is required to be evaluated by New York City, and a report must be completed 18 months after the Project commences.

2 The MTA Reform and Traffic Mobility Act exempts the Project from the requirements of the New York State Environmental Quality Review Act, New York CEQR, the New York City Uniform Land Use Review Procedure, and any other local law of the City of New York of like or similar effect. NYCDOT and other New York City (NYC) agencies use the parking assessment methodology in environmental review documents to assess the potential effects of public and private projects on the supply of and demand for parking in NYC. The parking methodology is also used at times in geographies outside NYC in environmental review documents, such as when the lead agency is based in NYC. The City of New York first published the *CEQR Technical Manual* in 1991 and has released several versions since then to update methodologies based on new information and practical experience. The *CEQR Technical Manual* can be found at https://www1.nyc.gov/site/oec/environmental-quality-review/technical-manual.page.

peak hour at any individual intersection.[3] According to the *CEQR Technical Manual* methodology, that level of new vehicle trips may be large enough to result in a corresponding increase in demand for parking spaces at facilities within a quarter-mile[4] of a project, and detailed analysis of the projected increase in demand for parking relative to existing parking capacity and utilization at individual parking facilities is appropriate at such locations.

The analysis of the Project's potential effects on parking began with a review of the New York Metropolitan Transportation Council (NYMTC) Best Practice Manual (BPM) results for the Project to identify commuter rail stations and park-and-ride facilities where there would be 50 or more new vehicle trips in the peak hours resulting from the Project and, if warranted, additional analysis would be conducted.

Next, should the aforementioned tiered evaluation identify that a detailed parking analysis is warranted, the *CEQR Technical Manual* presents the methodology for determining adverse parking effects. These effects could be considered adverse depending on the location, utilization, and available supply of existing parking capacity according to surveys, and projected increase in parking demand from a project. In some circumstances, projects could adversely affect parking conditions when the demand for parking generated by a project cannot be accommodated by available parking supply, and in other circumstances, this effect would not be categorized as adverse but would be disclosed as a parking shortfall. The *CEQR Technical Manual* identifies certain neighborhoods of New York City as areas where a parking shortfall would not constitute an adverse effect because of the many other alternative modes of transportation there (i.e., where there are subway stations within a quarter-mile[5]) that do not limit trip-making to solely driving and parking. These neighborhoods are defined as "Parking Zones 1 and 2" in the *CEQR Technical Manual*. In these zones, when a project creates or exacerbates demand for parking exceeding parking supply, this is considered a shortfall but not an adverse effect.[6] Parking Zones 1 and 2 encompass all of Manhattan (including Roosevelt Island) and all or parts of the neighborhoods of the South Bronx in the Bronx, Flushing, Jamaica, Long Island City/Astoria in Queens; and Downtown Brooklyn and Greenpoint/Williamsburg in Brooklyn (**Figure 4D-1**).

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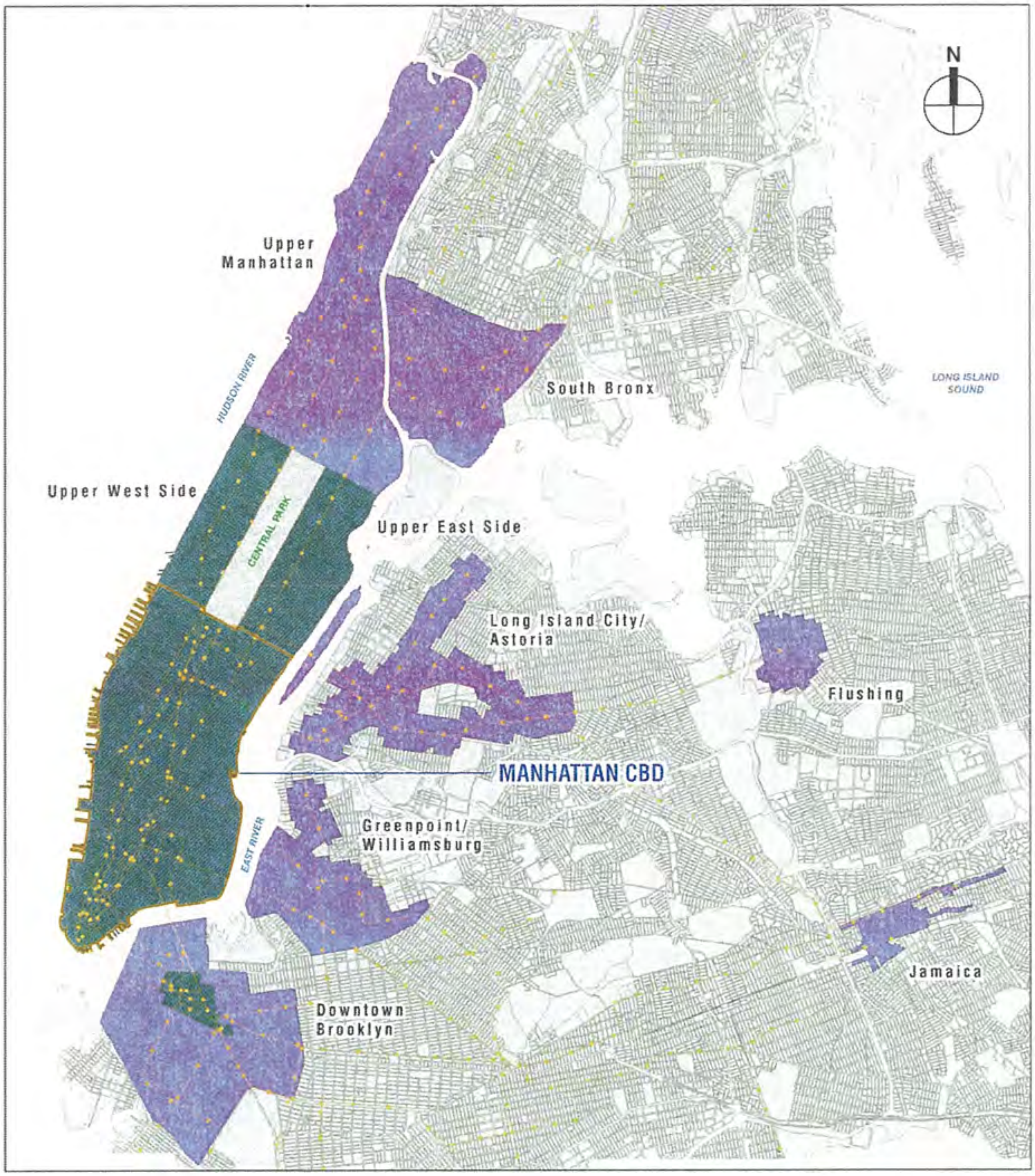
3 According to the *CEQR Technical Manual*, "if the proposed project would generate fewer than 50 peak hour vehicle trips, the need for further traffic analysis would be unlikely." This is because the added traffic congestion from fewer than 50 vehicle trips per hour would likely fall below the published CEQR thresholds defining significant adverse traffic impacts. However, it also states that "proposed projects affecting congested intersections have at times been found to create significant adverse traffic impacts when their trip generation is fewer than 50 peak hour vehicle trips, and therefore, the lead agency, upon consultation with NYCDOT may require analysis of such intersections of concern."

4 The *CEQR Technical Manual* states, "in general, a quarter-mile walk (taking approximately 5 to 10 minutes) is considered the maximum distance from primary off-site parking facilities to the project site," and further explains that parking availability, the destination type, and geography of the area can increase or decrease the maximum distance people are willing to walk from parking to a destination.

5 Based on the FHWA's *Pedestrian Safety Guide for Transit Agencies*, most people are willing to walk for 5 to 10 minutes (or approximately one-quarter to one-half mile) to a transit stop, and people may be willing to walk considerably longer distances when accessing heavy rail services. https://safety.fhwa.dot.gov/ped_bike/ped_transit/ped_transguide/ch4.cfm#a.

6 City of New York Mayor's Office of Environmental Coordination. 2020. *City Environmental Quality Review Technical Manual*. Chapter 16, "Transportation," pp. 16 to 67.

Figure 4D-1. *City Environmental Quality Review Technical Manual* Parking Zones



CBD Tolling Zone Boundary (Excluding West Side Highway/Route 9A and FDR Drive)
MTA Subway Station
MTA Subway Line
Zone 1
Zone 2
All Other Zones

Source: City of New York 2020 *City Environmental Quality Review Technical Manual*, Map 16-2.
[Note: For an audio description, please go to the following link: https://www.youtube.com/watch?v=e3t1w-ENOZ8&list=PLZHkn788ZQJPEY5zv-dr2gzkzMQFMgb_2&index=2.]

In addition, project-related shortfalls in parking may not constitute an adverse effect if other parking is available within a reasonable walking distance. Outside of Parking Zones 1 and 2, increases in parking demand that result in parking shortfalls can constitute adverse effects when the resulting parking shortfall exceeds more than half of the available on-street and off-street parking spaces within a quarter-mile of the location where the shortfall would occur. This determination should take into consideration the availability and extent of transit in the area and its proximity to the new parking demand, features of a project that result in vehicle trip reductions, and travel modes of customers in the area.

4D.3 AFFECTED ENVIRONMENT

4D.3.1 Regional Study Area

The regional study area for this EA includes 28 counties in the New York metropolitan area, which are the main catchment area for trips to and from the Manhattan CBD (see **Chapter 3, "Environmental Analysis Framework," Section 3.3.1.1**). The region has an extensive public transit network that includes commuter and intercity rail providing service along routes terminating at or near the Manhattan CBD, buses operating throughout the region, light rail and subways, ferries, and a tramway. **Subchapter 4C, "Transportation: Transit,"** provides a description of transit services throughout the regional study area, including those that serve the Manhattan CBD.

As described in **Section 4D.1**, the analysis includes an assessment of commuter parking demand at on-street parking and off-street parking, where present, at and near public transit facilities in the regional study area, where the Project's commuter parking effects are anticipated to be most concentrated. Specifically, transportation modeling predicts that increases in vehicular trips to public transit would be highest at and near commuter rail and park-and-ride facilities, and, relatively, that there would be much lower increases in vehicular trips to subway stations, light rail, and other modes of public transit without dedicated commuter parking facilities nearby. Therefore, this subsection evaluates parking utilization and demand at and near commuter rail and park-and-ride facilities, and other subsections discuss general parking utilization and capacity in New York City outside the Manhattan CBD, and in the Manhattan CBD, related to the Project.

While approximately 29 percent of the regional workforce commutes to work via public transit, this share is substantially higher for commuters to jobs in New York City (approximately 56 percent of workers with jobs in New York City use public transportation to travel to work) and is even greater for commuters to jobs in the Manhattan CBD (more than 85 percent of workers with jobs in the Manhattan CBD use public transportation to travel to work (see **Tables 6-5 and 6-6** in **Chapter 6, "Economic Conditions"**).[7]

Most of the approximately 400 intercity and commuter rail stations[8] in the regional study area have parking lots and garages for rail passengers to use. The parking facilities at rail stations vary in size from small

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[7] Sources: Regional and New York City workforce data from American Community Survey 2015–2018 5-year estimates, U.S. Census Bureau; CBD data from Census Transportation Planning Package, 2012–2016, U.S. Census Bureau.

[8] Metro-North Railroad map. 2022. http://web.mta.info/mnr/html/mnrmap.htm; Long Island Rail Road map. 2022. http://web.mta.info/lirr/Timetable/lirrmap.htm; and New Jersey Transit Commuter Rail map including PATH, Newark, and Hudson Bergen Light Rail. 2022. https://d2g63oyneaimm8.cloudfront.net/sites/default/files/pdfs/rail/Rail_System_Map.pdf.

surface lots to large, multilevel garages and are owned by the transit agency, a private operator, or the municipality where the station is located. Commuter rail stations typically charge a fee to park. Some facilities restrict use to residents of the municipality, some require a monthly permit for their use, and some are available to the general public. An individual rail station might have a combination of parking operators and multiple types of fee structures within one or at multiple parking facilities.

In addition, several other rail and non-rail transit hubs in the regional study area have parking facilities for their customers, such as the PATH Journal Square Station and various commuter park-and-ride lots with access to bus service into New York City. While most commuters using commuter rail and park-and-ride lots drive either alone or in a carpool to the transit facility, others walk, bike, or are dropped off there by local buses, shuttles, and private or for-hire vehicles.

Typically, parking facilities at the regional study area's commuter rail stations and transit hubs are well-used. Many are at capacity (or at least at "effective capacity," when a user perceives an off-street parking facility is full, which for commuter rail parking facilities is typically considered at or exceeding 85 percent utilization), and some facilities have waiting lists for additional parking demand that the parking operators (i.e., transit agency, municipality, or private entity that controls the facility) maintain. Based on information from the Metropolitan Transportation Authority for the Long Island Rail Road and Metro-North Railroad and from NJ TRANSIT, average pre-COVID-19 pandemic parking utilization at transit facilities across the regional study area ranged from approximately 75 percent to 100 percent of capacity, with many individual facilities reaching their effective capacity (see **Tables 4D.1.1, 4D.1.2, and 4D.1.3** in **Appendix 4D.1, "Transportation: Parking Utilization at Commuter Rail Stations in the Regional Study Area"**).

4D.3.2 New York City Outside the Manhattan CBD

As described in **Section 4D.1**, general parking utilization and capacity are discussed in this subsection to characterize the potential effects of the Project on parking. Many neighborhoods throughout New York City have curbside parking on major and minor streets. This parking is subject to regulations that limit long-term parking in business districts and that prohibit parking on some busy streets during peak periods to create capacity for traffic or buses. In addition, neighborhoods throughout New York City are subject to New York City's alternate-side parking regulations, which prohibit parking during certain times to allow street cleaning. In recent years, several New York City programs that promote repurposing on-street parking spaces with other uses have reduced the number of on-street parking spaces. These include Citi Bike, NYCDOT's bike share program, which places bike share docking stations in former on-street parking spaces; Neighborhood Loading Zone, which dedicates more curb space to commercial loading/unloading; Open Restaurants, which allows restaurants and other food-service establishments to convert on-street parking spaces to customer seating as a temporary program during the COVID-19 pandemic enabled through an emergency order; and the Open Streets program using the same emergency order as Open Restaurants, which allows certain street segments to be temporarily closed to through vehicles. New York City is currently transitioning the temporary Open Restaurants and Open Streets programs to be permanent, so the reduced number of on-street parking spaces resulting from those temporary programs is anticipated to continue. Throughout New York City, curbside parking is generally heavily used, with high demand and few available spaces during most times of the day. Although a specific survey was not conducted for this Project or can be cited, parking surveys performed as part of traffic studies in New York City typically show

high levels of weekday daytime utilization for on-street parking. Consequently, on-street spaces are generally not a reliable source of parking and finding available parking spaces that are not already occupied can involve substantial time searching for an available space.

The neighborhoods closest to the Manhattan CBD, including the Upper East Side (i.e., East 59th Street to East 96th Street, from Central Park to the East River), the Upper West Side (i.e., West 59th Street to West 110th Street, from Central Park to the Hudson River), Long Island City in Queens, and Williamsburg and Downtown Brooklyn in Brooklyn, have curbside parking on local streets subject to the regulations noted above. This parking is typically heavily used. **Figure 4D-2** shows the locations of these neighborhoods. Some commercial centers in Brooklyn and Queens, including Long Island City, Flushing, and Jamaica in Queens, have public off-street parking facilities, and these too are typically heavily used.

4D.3.3 Manhattan CBD

As described in **Section 4D.1,** general parking utilization and capacity are discussed in this subsection to characterize the potential effects of the Project on parking. Curbside parking exists throughout the Manhattan CBD. To provide for bus lanes on some north–south avenues, curbside parking is generally restricted during and between the weekday AM and PM peak commuter hours but is allowed overnight and on weekends. Numerous special parking regulations are within the Manhattan CBD, but in general, parking is allowed on both curbsides of the east–west streets, except for two-way, primary crosstown streets such as 14th Street, 23rd Street, 34th Street, 42nd Street, and 57th Street and near the entrances to and exits from bridges and tunnels connecting to the Manhattan CBD. Parking on major avenues and on side streets within Midtown Manhattan is generally metered to limit parking duration, and parking on all streets is subject to New York City's alternate-side parking regulations, which prohibit parking during certain times to allow street cleaning. The Manhattan CBD is subject to the same programs (e.g., Citi Bike, Neighborhood Loading Zone, Open Restaurants, and Open Streets) that have reduced and will continue to reduce the amount of on-street parking in New York City outside of the Manhattan CBD (see **Section 4D.3.2**). Throughout the Manhattan CBD, curbside parking is in high demand and is heavily used, with limited available spaces during most times of typical weekdays. Additionally, metered parking rates regulated by NYCDOT are priced higher in the Manhattan CBD than elsewhere in New York City.

The Manhattan CBD has approximately 600 off-street parking facilities (surface lots and parking garages) with a total capacity of nearly 90,000 parking spaces. While a specific survey was not conducted for this Project, surveys for numerous development projects in the Manhattan CBD areas of Lower Manhattan and Midtown[9] over the past several years have found that off-street parking facilities were at or near capacity on weekdays throughout the Manhattan CBD. In many parts of the Manhattan CBD near shopping and entertainment venues (e.g., Rockefeller Center and the Theater District) as well as major institutional uses (e.g., hospitals and museums), off-street parking facilities are heavily used in the evenings and on weekends. In addition to off-street parking for periodic use by the public, many off-street parking facilities also provide monthly parking for residents of the Manhattan CBD and commuters.

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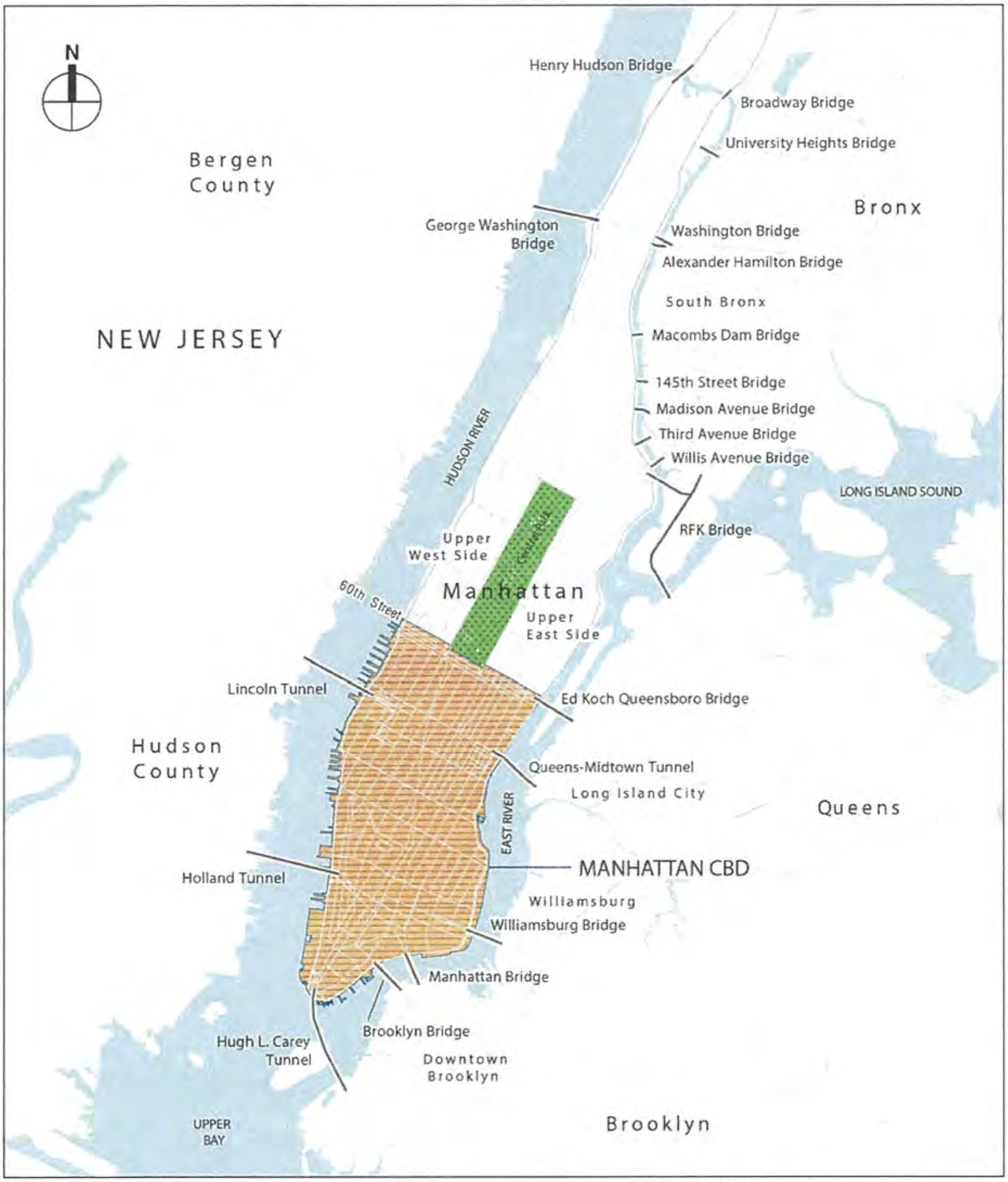
9 Source: Recently completed Environmental Impact Statements for projects proposed in the Manhattan CBD, including *Phased Redevelopment of Governors Island South Island Development Zones Final Second Supplemental Generic EIS* (2021), *Two Bridges Large Scale Residential Development Final EIS* (2018), and *Greater East Midtown Rezoning Final EIS* (2017).

Figure 4D-2. General Location of Neighborhoods Near the Manhattan Central Business District



General Location of Manhattan Central Business District (CBD)
Parks and Open Space
Bridges
0 2 MILES

Note: The MTA Reform and Traffic Mobility Act defines the Manhattan CBD as the area south of and inclusive of 60th Street but excluding the West Side Highway/Route 9A and the FDR Drive

Source: ArcGIS Online, https://www.arcgis.com/index.html.

4D.4 ENVIRONMENTAL CONSEQUENCES

4D.4.1 No Action Alternative

The No Action Alternative would not implement a vehicular tolling program. The No Action Alternative would not substantially change demand for on-street and off-street parking in the regional study area, or within or outside the Manhattan CBD compared to existing conditions. In the No Action Alternative, the demand for parking facilities and curbside spaces within and outside the Manhattan CBD would likely be comparable to current conditions, with limited available capacity, especially near heavily used transit stations.

4D.4.2 CBD Tolling Alternative

REGIONAL STUDY AREA

The BPM results show that all tolling scenarios for the CBD Tolling Alternative would decrease vehicle trips entering and leaving the Manhattan CBD with a corresponding increase in transit trips to the Manhattan CBD. There would be as much as a 9.2 percent decrease in vehicle-miles traveled (VMT) to as little as a 7.6 percent decrease in VMT for the Manhattan CBD from the Project, compared to the No Action Alternative (see **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling"**). There would be as little as a 0.7 percent increase in transit share to as much as a 1.6 percent increase in transit share from the Project, compared to the No Action Alternative. Consequently, there would be a decrease in demand for parking within the Manhattan CBD and an increase in demand for parking at the region's transit stations and commuter park-and-ride locations.

As discussed in **Subchapter 4C, "Transportation: Transit,"** the evaluation of the effects of the CBD Tolling Alternative on transit ridership (subway, commuter rail, and bus passengers) outside the Manhattan CBD considered groups of stations together, rather than individual stations. In addition, projected transit ridership increases as reported by the BPM at individual transit stations (including commuter rail or bus stations, park-and-ride facilities, and subway stations) were also evaluated to forecast the number of new vehicle trips they would create at each of the localized station groupings. As described in **Section 4D.3** transportation modeling predicts that increases in vehicular trips to public transit would be highest at and near commuter rail and park-and-ride facilities, and, relatively, there would be much lower increases in vehicular trips to subway stations, light rail, and other modes of public transit without dedicated commuter parking facilities nearby. Although there could initially be some modest level of vehicular traffic searching for parking in neighborhoods outside the Manhattan CBD to avoid the toll, the behavior would most likely be short-lived as part of the adjustment process. Time spent by motorists searching unsuccessfully for free, available parking just outside the Manhattan CBD boundary would eventually result in the outcomes anticipated by the transportation modeling, which forecasts an overall reduction in vehicular traffic and an increase in transit use in the regional study area.

Based on the BPM results, the increase in commuters at individual stations or park-and-ride facilities outside the Manhattan CBD would be distributed throughout the region, and no locations would have

increases in vehicle trips of 50 or more vehicles in the peak hour for any tolling scenario.*[10]* In the regional study area outside New York City, the increase in transit ridership from the Project would primarily be served by commuter rail and bus. Commuter and intercity rail make up 11.4 percent of AM peak-period person-trips to and from the Manhattan CBD on an average weekday (see **Subchapter 4C, "Transportation: Transit")**. As stated **in Subchapter 4C**, "MTA bus services account for approximately 1.6 percent of all trips into and out of the Manhattan CBD. NJ TRANSIT bus service carries about 5.3 percent of all trips. Other private bus carriers (such as Greyhound, Coach USA, Academy, DeCamp, and Lakeland) with service to the Port Authority Bus Terminal and on-street in Manhattan account for less than 1 percent of all trips into and out of the Manhattan CBD." Therefore, the 0.7 to 1.6 percent increase in transit usage from the Project (see **Table 4A-8 in Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling")** would be distributed among 400 commuter rail stations consisting of Metro-North, LIRR, and NJ TRANSIT, The PATH service, MTA bus, NJ TRANSIT Bus, and private carriers, which would not generate more than 50 vehicles per hour at any transit station or commuter park-and-ride location. Moreover, the new vehicle trips at stations would include some customers who would be dropped off without parking and therefore would not add to the demand for parking. Because other modes of public transit in the regional study area (e.g., subways, light rail) would incur even fewer additional vehicle trips as a result of the Project, those locations would also not exceed 50 more vehicles in the peak hour for any tolling scenario. Consequently, using the tiered methodology of the *CEQR Technical Manual* for analysis of parking, no detailed analysis of parking is warranted, and it can therefore be concluded that no adverse effect would occur to parking conditions at locations in the regional study area.

Although there would be no adverse effect on parking utilization based on the *CEQR Technical Manual* methodology, the Project would generate parking demand near some public transit facilities in the regional study area, which would exceed supply if the facility is currently at or over capacity.

NEW YORK CITY OUTSIDE THE MANHATTAN CBD

With the CBD Tolling Alternative, the number of commuters and visitors to the Manhattan CBD who would use transit for their journey would increase in all tolling scenarios. As described in **Subchapter 4A**, the change in the transit mode share would range from an increase of 1.0 percent (Tolling Scenario B) to 2.3 percent (Tolling Scenario E). Some of these new transit users would drive to transit stations in New York City outside the Manhattan CBD to access transit to complete their journey. However, based on lower auto ownership rates and lack of parking availability in New York City, as compared to the regional study area outside New York City, the driving trips to parking would be at far lower numbers than commuter rail and park-and-ride facilities described in the regional study area. Consequently, the CBD Tolling Alternative would slightly increase the number of drivers who would seek parking near transit facilities in New York City outside the Manhattan CBD.

[10 For the Final EA, the Project Sponsors committed to additional mitigation measures (see Chapter 16, "Summary of Effects," Table 16-2). These new mitigation commitments neither require a change in the tolling scenarios used for the analyses in the EA nor change the fundamental conclusions of the EA (see Chapter 3, "Environmental Assessment Framework," Section 3.3.3).]

Based on the BPM results, the increase in the number of travelers at individual transit facilities in New York City outside the Manhattan CBD would be widely distributed. Within New York City, the 0.7 to 1.6 percent increase in transit usage from the Project would be distributed among commuter rail and subway stations within New York City. Subways, which carry 61.9 percent of these commuters, most often do not have dedicated parking facilities and little to no available on-street or off-street parking nearby. Parking at commuter rail stations within New York City is also very limited. Moreover, the new vehicle trips at transit facilities would include some customers who would be dropped off without parking and therefore would not add to the demand for parking. According to Metro-North Railroad and Long Island Rail Road data, approximately 50 percent and 60 percent of transit passengers, respectively, drive and park to access stations, on average, during the AM peak period.

Applying an average, regional vehicle occupancy factor of 1.10 from 2012 to 2016 Census Transportation Planning Products Reverse Journey to Work data to the new transit riders that are distributed across transit stations within the study area, no station would exceed 32 vehicles per hour (vph) at commuter rail stations or 28 vph at subway stations. Consequently, using the tiered methodology of the *CEQR Technical Manual*, no adverse effect would occur to parking conditions at locations in New York City outside the Manhattan CBD.

There is potential that the CBD Tolling Alternative would increase parking demand immediately outside the Manhattan CBD in the neighborhoods just north of the Manhattan CBD boundary at 60th Street (the Upper East Side and Upper West Side); see **Figure 4D-2** for their locations. Modeling conducted for this Project using the BPM shows that the number of cars on each of the avenues immediately north of 60th Street would decrease under all tolling scenarios; therefore, there would not be an increase in parking demand in those neighborhoods. However, there may be economic considerations and, as described in **Chapter 6, "Economic Conditions," Section 6.4.3.2,** if an increase in demand were to occur just north of the 60th Street Manhattan CBD boundary, that demand would be accommodated either by the existing off-street parking spaces where available or—if there were capacity constraints—through upward adjustments in parking fees. These factors would likely offset potential changes in parking behavior resulting from the CBD Tolling Alternative. In any case, as noted earlier in the discussion of the *CEQR Technical Manual* methodology used to assess parking changes associated with projects in New York City, increases in parking demand that cause parking shortfalls in Parking Zones 1 and 2 are not considered adverse effects (see **Figure 4D-1**).

Although there would be no adverse effect on parking utilization based on the *CEQR Technical Manual* methodology, the Project would generate parking demand outside the Manhattan CBD, which could exceed supply if the area is currently at or over capacity. To further examine the potential effects of the Project on parking supply and demand, the MTA Reform and Traffic Mobility Act states that the City of New York must study the effects of the Project on parking within and around the Manhattan CBD, and a report must be completed 18 months after the Project commences.

MANHATTAN CBD

The CBD Tolling Alternative would decrease the number of daily private vehicle trips to the Manhattan CBD under all tolling scenarios. As shown in **Table 4A-9 in Subchapter 4A, "Transportation: Regional**

Transportation Effects and Modeling," the decrease in vehicle trips would range from 15,536 trips by private vehicle (drive alone or carpool) in Tolling Scenario A to approximately 41,936 trips by private vehicle (drive alone or carpool) in Tolling Scenario E. The decrease in vehicle trips would also result in a decrease in parking demand in the Manhattan CBD. While the demand for parking spaces in the Manhattan CBD from residents within the Manhattan CBD would likely generally remain unchanged, the demand from those driving into the Manhattan CBD each day from other locations would decrease in comparison to the No Action Alternative. This reduction would be spread across the approximately 600 off-street parking facilities with nearly 90,000 parking spaces in the Manhattan CBD as well as the numerous on-street parking spaces in the Manhattan CBD. (**Chapter 6, "Economic Conditions,"** provides an analysis of the potential economic effects of the CBD Tolling Alternative on the off-street parking industry in the Manhattan CBD.) Therefore, the CBD Tolling Alternative would not create or exacerbate a parking shortfall in the Manhattan CBD.

4D.5 CONCLUSION

Most of the parking facilities near transit stations are well-used with limited available capacity, and the Project would generate parking demand near some public transit facilities in the regional study area, which would exceed supply if the facility is currently at or over capacity. The increase in commuters at individual stations or park-and-ride facilities would be distributed throughout the region, and no locations would have increases in vehicle trips of 50 or more vehicles in the peak hour for any tolling scenario. Therefore, no adverse effect on parking conditions would occur at locations in the regional study area.

The Project would generate parking demand outside the Manhattan CBD, which could exceed supply if the area is currently at or over capacity. To further examine the potential effects of the Project on parking supply and demand, the MTA Reform and Traffic Mobility Act states that the City of New York must study the effects of the Project on parking within and around the Manhattan CBD, and a report must be completed 18 months after the Project commences.

While the demand for parking spaces in the Manhattan CBD from residents within the Manhattan CBD would likely generally remain unchanged, the demand from those driving into the Manhattan CBD each day from other locations would decrease in comparison to the No Action Alternative.

Table 4D-1 summarizes the effects of the CBD Tolling Alternative on parking.

Table 4D-1. Summary of Effects of the CBD Tolling Alternative on Parking

SUMMARY OF EFFECTS	EFFECT FOR ALL TOLLING SCENARIOS	POTENTIAL ADVERSE EFFECT	MITIGATION AND ENHANCEMENTS
All tolling scenarios would result in a reduction in parking demand within the Manhattan CBD of a similar magnitude to the reduction in auto trips into the Manhattan CBD. With a shift from driving to transit, there would be increased parking demand at subway and commuter rail stations and park-and-ride facilities outside the Manhattan CBD.	Reduction in parking demand due to reduction in auto trips to the Manhattan CBD; small changes in parking demand at transit facilities outside the Manhattan CBD, corresponding to increased commuter rail and subway ridership	No	No mitigation needed. No adverse effects.

4E. Pedestrians and Bicycles

4E.1 INTRODUCTION

This subchapter describes the potential effects of the CBD Tolling Alternative on pedestrian circulation; bicycle routes and bicycle infrastructure; and vehicular, pedestrian, and bicycle safety.

The regional study area for this subchapter includes commuter and intercity rail stations providing service along routes terminating within or near the Manhattan CBD, and bus stations, light rail and subway stations, ferry stops, and a tramway station ("transit stations") in the 28-county regional study area. Transportation modeling predicts that increases in pedestrian and bicycle trips to/from public transit would be highest at and near commuter rail and subway stations with higher ridership and high occurrences of walk/bike mode share, and this subchapter examines the potential effects of implementing the CBD Tolling Alternative at such locations. The modeling shows that there would be lower increases in new trips on light rail, buses, ferries, and other modes of public transit with lower ridership and/or higher occurrences of vehicular mode share.

The first part of this subchapter summarizes potential changes in pedestrian circulation near transit stations in the regional study area that would result in an increase in passenger activity from the Project. The second part of this subchapter presents a qualitative assessment of the Project's effects on existing and future bicycle facilities (i.e., on-street bicycle lanes or shared-lane routes), including bicycle trips generated by the Project's forecast increased activity at and near transit stations. The final section of this subchapter is an assessment of vehicular, bicycle, and pedestrian safety for intersections where detailed pedestrian analyses were performed.

4E.2 PEDESTRIAN CIRCULATION

4E.2.1 Methodology

The analysis of pedestrian circulation in this subchapter considers the potential for increased crowding on sidewalks, corners, and crosswalks at or around transit stations where the CBD Tolling Alternative is predicted to increase the number of passengers. This would occur because of changes to travel patterns, where some people would no longer drive to the Manhattan CBD and instead use transit to travel there.

This analysis was conducted using the methodologies and effects criteria outlined in the City of New York's *CEQR Technical Manual*. The FHWA and NYSDOT have design criteria for pedestrian facilities, but the guidance does not lay out procedures to identify potential adverse effects from project-generated increases in foot or bicycle traffic in dense urban areas such as New York City. It should be noted that *CEQR Technical Manual* guidance does not conflict with the Federal and state design criteria for pedestrian and bicycle facilities.

Using the *CEQR Technical Manual* methodologies, the analysis included the following steps:

- Based on the New York Metropolitan Transportation Council (NYMTC) Best Practice Manual (BPM) results for the Project (**Subchapter 4C, "Transportation: Transit"**), the analysis identified all transit stations where the CBD Tolling Alternative would result in 200 or more new pedestrian trips in the busiest hour for any tolling scenario. (The busiest hour is the "peak hour," and was based on observed pedestrian conditions; this was not necessarily the same peak hour that was used for the traffic analyses discussed in **Subchapter 4B, "Transportation: Highways and Local Intersections."**)
- For transit stations where the CBD Tolling Alternative would result in 200 or more new pedestrian trips in the peak hour for any tolling scenario, the analysis identified specific locations—such as at a particular intersection—that would have an increase of 200 or more new pedestrian trips in the peak hour. Based on the *CEQR Technical Manual* methodology, this is the level of new pedestrian trips with the potential to result in an adverse effect on pedestrian flows. For these transit stations, additional analysis was conducted of the effects of additional pedestrians resulting from the Project.
- For transit stations where the CBD Tolling Alternative would result in 200 or more new pedestrian trips at a specific location in the peak hour for any tolling scenario, the analysis involved assigning those trips along the most direct and logical routes to workplaces, residences, and other key destinations to identify individual pedestrian elements that would experience an increase in pedestrian activity in the peak hour. Pedestrian elements are defined as the street components used by people walking, including sidewalks, crosswalks, and street corners (called "corner reservoirs"[1]). Transit elements such as subway station control area, stairs, escalators, and platforms that are not considered pedestrian elements are described in **Subchapter 4C, "Transportation: Transit"**; therefore, these elements are excluded from the discussion below. This quantified analysis used the methodologies presented in the 2010 *Highway Capacity Manual*. Using these methodologies, the primary performance measure for pedestrian circulation is pedestrian space, expressed as square feet per pedestrian (SFP), which indicates the quality of pedestrian movement and comfort. The calculation of SFP was based on the pedestrian volumes by direction, the effective sidewalk or walkway width, and pedestrians' average walking speeds. The SFP formed the basis for a sidewalk level of service (LOS) analysis.[2]
- At transit stations where the increase in pedestrians would be fewer than 200 people in the peak hour at any specific location, no adverse effect would occur to pedestrian conditions for any tolling scenario, based on the *CEQR Technical Manual* guidance.

As part of the analyses, data regarding existing pedestrian volumes as well as traffic operations and volumes (for turning vehicles that conflict with pedestrians within a crosswalk) were collected in June and October 2019 at locations identified later in this subchapter. These data were collected during the weekday AM, midday, and PM peak periods (7:00 a.m. to 10:00 a.m., 11:00 a.m. to 2:00 p.m., and 4:00 p.m. to 7:00 p.m.,

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1 As described in **Appendix 4E, "Transportation: Supporting Documentation for Pedestrian Analyses,"** corner reservoirs are the corner areas of sidewalks, serving both standing pedestrians (queued to cross a street) and circulating pedestrians (crossing the street or moving around the corner).

2 As described in **Appendix 4E**, LOS is a scale used to describe the operations of traffic, transit, or pedestrian facilities based on quantified information. LOS ranges from A (uncongested) to F (substantially congested/poor operation). The specific parameters used to define LOS vary by the type of analysis.

respectively). Inventories of total and effective widths, crosswalk lengths, street furniture, and other obstructions were conducted to provide appropriate inputs for the operational analyses. NYCDOT provided official traffic signal timings for the analysis locations.

An annual background growth rate of 0.50 percent was conservatively applied to estimate the No Action Alternative pedestrian volumes in the Manhattan CBD at the specific locations analyzed (to account for discrete trip-making from large development projects underway near the analysis locations). Note that this subchapter did apply a background growth factor while **Subchapter 4B, "Transportation: Highways and Local Intersections,"** and **Subchapter 4C, "Transportation: Transit,"** did not because, on a broader basis, the pre-COVID-19 pandemic traffic and transit conditions would be representative of the 2023 analysis year. MTA anticipates that transit ridership—and therefore pedestrian activity surrounding transit stations—will reach previous levels several years after the 2020 decline in ridership.[3]

Appendix 4E, "Transportation: Supporting Documentation for Pedestrian Analyses," presents details on the *CEQR Technical Manual* analysis methodologies, including adverse effect criteria.

TOLLING SCENARIO SELECTED FOR THIS PEDESTRIAN ANALYSIS

The tolling scenario that would result in the greatest increase in new pedestrian trips at transit stations within the Manhattan CBD was used for quantified analysis.[4] Based on the BPM results (**Subchapter 4C, "Transportation: Transit"**), the representative tolling scenario with the ***[greatest]*** effect is Tolling Scenario E, which ***[would]*** result in the largest number of new transit riders and therefore would add the highest pedestrian volumes on the sidewalks, street corners, and crosswalks adjacent to transit stations within the Manhattan CBD. Other tolling scenarios would generate fewer new pedestrian trips. (See **Chapter 2, "Project Alternatives,"** for a description of the tolling scenarios evaluated.)*[[5]]*

LOCATIONS FOR PEDESTRIAN ANALYSIS

As discussed earlier in this subchapter, the first steps in the analysis were to identify transit stations throughout the 28-county region where the CBD Tolling Alternative would add 200 or more new pedestrian trips in the peak hour, and then to identify any of those transit stations where the CBD Tolling Alternative would add 200 or more new pedestrian trips on any individual pedestrian element. **Figure 4E-1** shows the pedestrian analysis study area. Most transit stations in the region—both within and outside the Manhattan CBD—would have an increase of fewer than 200 peak-hour pedestrian trips under the CBD Tolling Alternative. Based on the BPM results, the CBD Tolling Alternative (Tolling Scenario E) would result in more than 200 new peak-hour pedestrian trips at the 16 transit stations identified in **Table 4E-1**.

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3 As described in Subchapter 4C, "Transportation: Transit," public transit ridership may reach 80 to 92 percent of pre-pandemic levels by end of 2024 according to an MTA-commissioned analysis prepared by McKinsey & Company.

4 As described in Chapter 2, "Project Alternatives," this document evaluates multiple tolling scenarios to identify the range of potential effects that could occur from implementing the Project. These tolling scenarios have a range of different toll amounts and toll structures, such as crossing credits, discounts, and/or exemptions. Ultimately, the TBTA Board would determine the toll amounts and toll structure to be implemented, which might differ from the tolling scenarios evaluated in this document.

[5 For the Final EA, the Project Sponsors committed to additional mitigation measures (see Chapter 16, "Summary of Effects," Table 16-2). These new mitigation commitments neither require a change in the tolling scenarios used for the analyses in the EA nor change the fundamental conclusions of the EA (see Chapter 3, "Environmental Assessment Framework," Section 3.3.3).]

Figure 4E-1. Pedestrian Analysis Study Area

Manhattan CBD (as defined by the MTA Reform and Traffic Mobility Act)

Transit Stations with More than 200 New Pedestrians per Hour

Transit Stations with an Individual Pedestrian Element that has More than 200 New Pedestrians per Hour

Park or Recreational Resource

Sources: ArcGIS Online, https://www.arcgis.com/index.html.

Table 4E-1. Transit Station Pedestrian Trip Assessment

TRANSIT STATIONS THAT WOULD HAVE MORE THAN 200 NEW PEDESTRIANS PER HOUR	INDIVIDUAL PEDESTRIAN ELEMENT THAT WOULD HAVE MORE THAN 200 NEW PEDESTRIANS PER HOUR
1. 14 Street–Union Square, Manhattan CBD (Nos. 4/5/6, and L/N/R/Q/W subway lines)	No
2. Herald Square/Penn Station New York, Manhattan CBD, includes the following: a. 34 Street–Herald Square subway station (B/D/F/ M/N/Q/R/W subway lines) b. 34 Street–Penn Station subway station (Nos. 1/2/3 subway lines) c. 34 Street–Penn Station subway station (A/C/E subway lines) d. 33rd Street Station (PATH) e. New York Pennsylvania Station (Amtrak, LIRR, NJ TRANSIT)	Yes
3. 42 Street–Bryant Park, Manhattan CBD (B/D/F/M subway lines and connection to Fifth Avenue No. 7 subway line)	No
4. 47-50 Streets–Rockefeller Center, Manhattan CBD (B/D/F/M subway lines)	No
5. Broadway–Lafayette Street, Manhattan CBD (B/D/F/M and No. 6 subway lines)	No
6. Canal Street, Manhattan CBD (J/N/Q/R/W/Z and No. 6 subway lines)	No
7. Canal Street, Manhattan CBD (A/C/E subway lines)	No
8. World Trade Center/Fulton Street, Manhattan CBD, includes the following: a. Fulton Street subway stations (Nos. 2/3/4/5 and A/C/J/Z subway lines) b. World Trade Center Station (PATH) c. Cortlandt Street Station (R/W subway lines)	Yes
9. Flushing Main Street, Queens County, New York (No. 7 subway line)	No
10. Atlantic Terminal, Kings County (Brooklyn), New York, includes the following: a. Atlantic Avenue–Barclays Center subway station (Nos. 2/3/4/5 and B/D/N/Q/R/W subway lines) b. Atlantic Terminal (LIRR)	No
11. Grand Central Terminal, Manhattan CBD, includes the following: a. 42 Street–Grand Central subway station (Nos. 4/5/6/7 and S subway lines) b. Grand Central Terminal (Metro-North Railroad)	No
12. Lexington Avenue/53 Street, Manhattan CBD (E/M subway lines and connection to 51 Street No. 6 subway line)	No
13. Second Avenue, Manhattan CBD (F/M subway lines)	No
14. Wall Street, Manhattan CBD (Nos. 2/3 subway lines)	No
15. Secaucus, Hudson County, New Jersey (NJ TRANSIT)	No
16. Hoboken Terminal, Hudson County, New Jersey (PATH and NJ TRANSIT)	No

Source: WSP, Best Practice Model 2021.

Following the steps described in the discussion of methodology, the following two areas (**Table 4E-1 and Figure 4E-1**) would have more than 200 new pedestrians in the peak hour at an individual pedestrian element (i.e., crosswalk, sidewalk, or corner reservoir):

- Herald Square/Penn Station New York
- World Trade Center/Fulton Street

Although 34 Street–Herald Square and 34 Street–Penn Station are separate stations, the effect of predicted pedestrian trips resulting from the CBD Tolling Alternative at these two stations were considered together, because the stations are in proximity to one another and many of the pedestrian routings to and from each

station would overlap. Similarly, pedestrian trips resulting from the CBD Tolling Alternative at the Cortlandt Street Station (R/W subway lines), WTC Cortland Street (1), and World Trade Center (PATH and E subway line) were considered together with Fulton Street because many of the pedestrian routings to and from each station would be in proximity and would share primary pedestrian routes. Therefore, Herald Square/Penn Station New York and World Trade Center/Fulton Street were considered as areas rather than stations in the pedestrian conditions analysis.

4E.2.2 Affected Environment

Existing pedestrian and traffic data were collected in June and October 2019 at the analysis locations adjacent to Herald Square/Penn Station New York and World Trade Center/Fulton Street. As previously described, the count data is conservative for characterizing existing (2021) pedestrian conditions. Peak-hour pedestrian volumes were tabulated from the peak-period pedestrian data collected in June 2019. Based on the collected data, the weekday AM and PM peak hours of pedestrian volumes at both analysis areas were 8:15 a.m. to 9:15 a.m. and 5:00 p.m. to 6:00 p.m., respectively, representing the peak work arrival and departure times in and around the transit facilities. (Midday pedestrian circulation would not vary because the predominant Project-generated change in activity would be during the weekday AM and PM peak hours when commuters would use transit in higher numbers. During the midday peak hour, commuters would mainly have the same pedestrian travel patterns irrespective of how the Project would change the mode shift in the AM and PM peak-hour work trip.) Using the methodology presented for pedestrian circulation, this section summarizes, and **Table 4E-2** presents, the LOS analysis results for the study area pedestrian elements near the two transit station areas. **Figure 4E-2** presents the locations of all analyzed pedestrian elements. (**Appendix 4E, "Transportation: Supporting Documentation for Pedestrian Analyses,"** presents the pedestrian LOS tables and peak-hour pedestrian volume figures.)

Table 4E-2. Existing (2021) Conditions Pedestrian Analysis Results (2019)

TRANSIT STATION AREA	PEA HOUR	PEDESTRIAN ELEMENT	NUMBER OF ANALYSIS LOCATIONS	NUMBER OF LOCATIONS THAT OPERATE AT			
				LOS C OR BETTER	LOS D	LOS E	LOS F
Herald Square/Penn Station New York	AM	Sidewalks	6	5	1	0	0
		Corner Reservoirs	5	5	0	0	0
		Crosswalks	3	1	0	2	0
	PM	Sidewalks	6	5	1	0	0
		Corner Reservoirs	5	5	0	0	0
		Crosswalks	3	1	0	1	1
World Trade Center/Fulton Street	AM	Sidewalks	1	1	0	0	0
		Corner Reservoirs	1	1	0	0	0
	PM	Sidewalks	1	1	0	0	0
		Corner Reservoirs	1	1	0	0	0

Source: AKRF, Inc.

The following two sections provide further detail on the pedestrian elements and results presented in the above table, and briefly describe the process by which the pedestrian elements were selected for detailed analysis using the previously presented methodology.

HERALD SQUARE/PENN STATION NEW YORK

The detailed assignment of pedestrian trips near Herald Square/Penn Station New York resulted in 2,051 new pedestrian trips in both AM and PM peak hours, which would result in 200 or more peak-hour pedestrian trips at the following 14 pedestrian elements:

- North sidewalk of West 34th Street between Seventh and Eighth Avenues
- West sidewalk of Eighth Avenue between West 35th and West 34th Streets
- North sidewalk of West 34th Street between Broadway and Seventh Avenue
- North sidewalk of West 34th Street between Seventh Avenue and Broadway
- North sidewalk along West 34th Street between Sixth and Fifth Avenues
- North sidewalk of West 32nd Street between Sixth and Seventh Avenues
- Northwest corner of Eighth Avenue and West 34th Street
- Southwest corner of Eighth Avenue and West 34th Street
- Northeast corner of Eighth Avenue and West 34th Street
- Northeast corner of Sixth Avenue and West 34th Street
- Northeast corner of Seventh Avenue and West 32nd Street
- North crosswalk of Eighth Avenue and West 34th Street
- North crosswalk of Sixth Avenue and West 34th Street
- North crosswalk of Seventh Avenue and West 32nd Street

Most of these pedestrian elements operate at LOS D (which is considered marginally acceptable) operations or better. The following locations operate at congested LOS E or LOS F conditions:

- The north crosswalk of Sixth Avenue and West 34th Street operates at LOS E in the AM peak hour and LOS F in the PM peak hour.
- The north crosswalk of Seventh Avenue and West 32nd Street operates at LOS E during the AM and PM peak hours.

WORLD TRADE CENTER/FULTON STREET

Based on the detailed assignment of pedestrian trips near World Trade Center/Fulton Street (1,222 new pedestrian trips in the peak hour), the CBD Tolling Alternative would result in 200 or more peak-hour pedestrian trips at the following two pedestrian elements:

- West sidewalk along Broadway between Liberty and Cortlandt Streets
- Northwest corner of Broadway and Liberty Street

Both pedestrian elements operate at acceptable LOS C or better during both peak hours.

4E.2.3 Environmental Consequences

NO ACTION ALTERNATIVE

Under the No Action Alternative, the Project Sponsors would not implement a vehicular tolling program. Pedestrian volumes would be similar to pre-pandemic levels as described above. (No Action Alternative pedestrian volumes were increased by 0.5 percent to reflect potential growth from new development in the area.) In the No Action Alternative, all the analysis locations would continue to operate at the same LOS as existing conditions. (**Appendix 4E, "Transportation: Supporting Documentation for Pedestrian Analyses,"** presents the detailed pedestrian LOS tables and peak-hour pedestrian volume figures.)

CBD TOLLING ALTERNATIVE

The CBD Tolling Alternative would result in increased pedestrian activity near transit stations throughout the regional study area. However, the increased volumes at many locations would not adversely affect pedestrian circulation or the LOS of sidewalks, corners, and crosswalks. At most transit stations presented in **Table 4E-1**, the volume of pedestrian trips would be distributed among different station entrances and different locations around the station, and the CBD Tolling Alternative would not result in adverse effects on pedestrian conditions. Additionally, because the additional volume of pedestrian trips generated by the Project adjacent to all other transit facilities in the regional study area would be even lower than at commuter rail and subway stations presented in **Table 4E-1**, the CBD Tolling Alternative would not result in adverse effects on pedestrian conditions at other transit facilities.

For the Herald Square/Penn Station New York and World Trade Center/Fulton Street areas, the projected increments for Tolling Scenario E would exceed 200 trips in the peak hour; therefore, an analysis was conducted to identify any adverse effects on pedestrian circulation. The pedestrian volumes generated by Tolling Scenario E were added to the No Action Alternative volumes to determine the CBD Tolling Alternative volumes (**Table 4E-3**). (**Appendix 4E, "Transportation: Supporting Documentation for Pedestrian Analyses,"** presents the detailed pedestrian LOS tables and peak-hour pedestrian volume figures.)

Table 4E-3. CBD Tolling Alternative 2023 Pedestrian Analysis Results

TRANSIT STATION AREA	PEA HOUR	PEDESTRIAN ELEMENT	NUMBER OF ANALYSIS LOCATIONS	NUMBER OF LOCATIONS THAT WOULD OPERATE AT			
				LOS C OR BETTER	LOS D	LOS E	LOS F
Herald Square/Penn Station New York	AM	Sidewalks	6	4	2	0	0
		Corner Reservoirs	5	5	0	0	0
		Crosswalks	3	1	0	2	0
	PM	Sidewalks	6	5	1	0	0
		Corner Reservoirs	5	5	0	0	0
		Crosswalks	3	1	0	1	1
World Trade Center/Fulton Street	AM	Sidewalks	1	1	0	0	0
		Corner Reservoirs	1	0	1	0	0
	PM	Sidewalks	1	1	0	0	0
		Corner Reservoirs	1	1	0	0	0

Source: AKRF, Inc.

Herald Square/Penn Station New York

As under existing and No Action Alternative conditions, with implementation of the CBD Tolling Alternative, all analysis locations near Herald Square/Penn Station New York would operate at marginally acceptable LOS D or better except for the following:

- The north crosswalk of Sixth Avenue and West 34th Street would operate at LOS E in the AM peak hour and LOS F in the PM peak hour.
- The north crosswalk of Seventh Avenue and West 32nd Street would operate at LOS E during the AM and PM peak hours.

Although there would be no change in the number of congested LOS E or LOS F pedestrian elements with or without the Project, there would be slight deteriorations in SFP values. Based on the *CEQR Technical Manual* adverse effects criteria (**Appendix 4E, "Transportation: Supporting Documentation for Pedestrian Analyses"**), the CBD Tolling Alternative could potentially result in adverse pedestrian effects near Herald Square/Penn Station New York, as follows:

- The west sidewalk of Eighth Avenue between West 34th and West 35th Streets would operate at LOS D with a decrease of 3.2 SFP in the AM peak hour and 2.9 SFP in the PM peak hour compared to the No Action Alternative.
- The Sixth Avenue and West 34th Street north crosswalk would operate at LOS E with a decrease of 2.2 SFP in the AM peak hour and at LOS F with a decrease of 0.8 SFP in the PM peak hour compared to the No Action Alternative.
- The Seventh Avenue and West 32nd Street north crosswalk would operate at LOS E with a decrease of 1.3 SFP in the AM peak hour compared to the No Action Alternative.

Figure 4E-2 shows the locations of adverse effects. The adverse effects at these three locations will be mitigated through standard measures that will be implemented as part of the Project under any tolling scenario, if needed. None of these measures would affect existing bicycle infrastructure in the street. Any additional vehicular traffic generated by increased transit activity related to the Project at transit hubs in the 28-county regional study area is not anticipated to measurably reduce safety conditions because this modest increased activity would be along routes already traveled by high volumes of traffic. Increased pedestrian space on sidewalks and crosswalks can be achieved via physical widening and/or removing or relocating obstructions. **Table 4E-4** shows the recommended measures and predicted conditions with their implementation. While potential measures are shown, each specific treatment for attaining increased pedestrian space at the affected locations will be developed in coordination with NYCDOT prior to its implementation. The Project Sponsors will undertake monitoring at the locations near Herald Square/Penn Station with identified potential adverse effects, including pre-implementation baselining and monitoring before and after the first year after implementation of the Project, starting no sooner than two months after implementation to account for a potential initial period of fluctuation in travel behavior.[6]

[6] For London's congestion zone, a Transit Cooperative Research Program report noted that traffic patterns stabilized at six weeks after charging began. See Chapter 14, "Road Value Pricing" in *Transit Cooperative Research Program Report 95: Traveler Response to Transportation System Changes*. p. 14-13. http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_95c14.pdf.

Figure 4E-2. Adverse Pedestrian Effects near Herald Square/Penn Station New York

Sources: ArcGIS Online, https://www.arcgis.com/index.html.

Table 4E-4. No Action Alternative, CBD Tolling Alternative, and CBD Tolling Alternative with Improvement Measures—Pedestrian Level of Service Analysis—Herald Square/Penn Station New York

LOCATION	PROJECT IMPROVEMENT MEASURES	NO ACTION		CBD TOLLING		CBD TOLLING (IMPROVED)	
		SFP	LOS	SFP	LOS	SFP	LOS
Weekday AM Peak Hour							
West sidewalk along Eighth Avenue between West 34th Street and West 35th Street	Provide 0.5 feet of additional width by removing constricting sidewalk obstruction (relocate movable planter so it is not directly across from parking sign pole; easy to implement).	31.5	D	28.3	D	31.4	D
Sixth Avenue and West 34th Street: north crosswalk	Widen the crosswalk by 2 feet (easy to implement).	12.8	E	10.6	E	11.8	E
Seventh Avenue and West 32nd Street: north crosswalk	Widen the crosswalk by 1 foot (easy to implement).	12.7	E	11.4	E	12.0	E
Weekday PM Peak Hour							
West sidewalk along Eighth Avenue between West 34th Street and West 35th Street	Provide 0.5 feet of additional width by removing constricting sidewalk obstruction (relocate movable planter so it is not directly across from parking sign pole; easy to implement).	28.6	D	25.7	D	28.7	D
Sixth Avenue and West 34th Street: north crosswalk	Widen the crosswalk by 2 feet (easy to implement).	6.8	F	6.0	F	6.8	F

Source: AKRF, Inc.

The monitoring results will be compared to the No Action SFP and LOS as well as the *CEQR Technical Manual* thresholds described above to validate the need for, and design of, mitigations such as crosswalk restriping, movable obstruction relocation, and other improvements as necessary to ensure there will be no adverse effects. **Table 4E-4** also notes the relative ease of implementation of each recommended measure.

World Trade Center/Fulton Street

With implementation of the CBD Tolling Alternative, the west sidewalk of Broadway between Liberty and Cortlandt Streets during the AM and PM peak hours and the northwest corner of Broadway and Liberty Street during the PM peak hour would operate at LOS C or better. The northwest corner of Broadway and Liberty Street would operate at LOS D in the AM peak hour with a decrease of 1.9 SFP as compared to LOS C in the No Action Alternative. Based on the expected LOS and the *CEQR Technical Manual* adverse effects criteria, the CBD Tolling Alternative would not result in any adverse pedestrian effects at pedestrian elements near World Trade Center/Fulton Street.

4E.3 BICYCLES

4E.3.1 Methodology

Neither the New York State Environmental Quality Review Act nor the *CEQR Technical Manual* describe a methodology for quantitative capacity analysis of bicycle facilities or identification of adverse effects on bicycle facilities. Because the BPM is not capable of estimating new bicycle trips from the CBD Tolling Alternative, it was assumed that 2 percent of the AM and PM peak-hour Project-generated transit-to-walk trips to Manhattan CBD transit stations would be bicycle trips (reflecting the greatest concentration of potential new bicycle trips throughout the region). This distribution of bicycle mode share is based on the New York Metropolitan Transportation Council's *Hub Bound Travel Data Report 2019*, which presents data showing that 2 percent of all trips entering and leaving the Manhattan CBD on a typical weekday were made by bicycle. Using this assumption, a qualitative assessment of existing and future on-street bicycle facilities, including the expected increase in bicycle trips at Herald Square/Penn Station New York and World Trade Center/Fulton Street, was prepared. The qualitative assessment compares the inventory of existing and proposed bicycle facilities surrounding station areas that would generate the highest volume of bicycle trips from the Project to the estimated volume of peak-hour bicycle trips generated by the Project to determine the potential for adverse effects.

4E.3.2 Affected Environment

In recent years, New York City has expanded its bicycle network, including new bicycle lanes and upgrades to existing bicycle lanes. The network is well established within and around the Manhattan CBD. **Figure 4E-3** shows the City of New York's bicycle map for the Manhattan CBD. NYCDOT plans to continue adding new bicycle lanes and enhancing existing ones throughout the city both in and outside the Manhattan CBD.

In the Manhattan CBD, several north–south avenues and many cross-streets have bicycle lanes that provide delineated bicycle travel adjacent to or separated from vehicular traffic. The bicycle network also connects to dedicated bicycle paths on the bridges to Brooklyn, Queens, and the Bronx, via the Staten Island Ferry to Staten Island, and across the George Washington Bridge to New Jersey. Encircling much of Manhattan, dedicated bikeways or shared-use paths extend through the length of most of Hudson River Park and the West Side Highway/Route 9A from the southern tip of Manhattan to the island's northern boundary with few gaps. Dedicated bikeways or shared-use paths also extend along much of the East Side along the East River waterfront.[7] North–south avenues (First, Second, Sixth, Seventh, Eighth, and Ninth Avenues) have bicycle lanes, and crosstown (east–west) bicycle lanes through the Manhattan CBD generally run in pairs on adjacent one-way streets, with small intervals between pairs.

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7 https://www1.nyc.gov/html/dot/downloads/pdf/nyc-bike-map-2021.pdf.

Figure 4E-3. Bicycle Routes in the Manhattan CBD

Source: NYCDOT and New York City Department of City Planning. May 2021. 2021 NYC Bike Map.

[Note: For an audio description, please go to the following link: https://www.youtube.com/watch?v=S2_sW9VNIK0&list=PLZHkn788ZQJPEY5zv-dr2gzkzMQFMgb_2&index=3.]

NYCDOT implemented bicycle infrastructure improvements in 2021 and has planned additional improvements in the near future. The CBD Tolling Alternative would not affect or prevent any of these planned improvements. The following recently implemented or planned pedestrian and bicycle improvements are within and near the Manhattan CBD:[8]

- Future conversion of Queensboro Bridge south and north outer roadways from a vehicular travel lane to pedestrian walkway and existing shared-use path to exclusive bike lane, respectively
- Conversion of a vehicular travel lane on the Brooklyn Bridge to a bicycle lane
- Creation of protected bicycle lane and parking along the following:
  - Columbus Avenue bicycle lane islands between West 59th Street and West 62nd Street
  - East 60th, East 61st, and East 62nd Streets between Fifth Avenue and York Avenue for Queensboro Bridge access
- Creation of bike lane adjacent to the median of Broadway from Columbus Circle to West 72nd Street

New York City has the nation's largest bicycle-sharing program—Citi Bike. People can rent bicycles at a kiosk or use a mobile app to pick up and return bicycles at any Citi Bike station. Approximately 1,300 Citi Bike stations with 20,000 bicycles are in New York City and approximately 260 Citi Bike stations with 6,000 bicycles are in the Manhattan CBD.[9] NYCDOT and Lyft (the operator of Citi Bike) plan to expand the system to serve additional neighborhoods by 2024. Citi Bike's Phase 3 plan will double the size of the Citi Bike service area and triple the number of shared bicycles.

4E.3.3 Environmental Consequences

NO ACTION ALTERNATIVE

In the No Action Alternative, there would not be a vehicular tolling program, and any changes in bicycling would likely result from background growth, improvements in cycling infrastructure and Citi Bike service, or new development in an area.

CBD TOLLING ALTERNATIVE

As described in **Section 4E.2.1**, the CBD Tolling Alternative would result in increases in peak-hour pedestrian volumes high enough to warrant detailed pedestrian analysis near the Herald Square/Penn Station New York and World Trade Center/Fulton Street transit hubs. Because expected higher bicycle use would be concentrated at transit hubs with the highest projected increases in pedestrian trips, these two areas have been assessed for bicycle effects. With up to 2,051 and 1,222 new pedestrian trips predicted in the peak hours, 41 and 24 new hourly bicycle trips would be generated by the Project at Herald Square/Penn Station New York and World Trade Center/Fulton Street, assuming a 2 percent bike share, respectively. Because there would be an average of fewer than one new bicycle trip per minute, these increases would be negligible compared to the magnitude of existing bicycle use adjacent to the two transit station complexes.

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8 NYCDOT, "Current Projects," https://www1.nyc.gov/html/dot/html/about/current-projects.shtml

9 CitiBike, https://www.citibikenyc.com/.

Outside the Manhattan CBD, the shift to bicycle use because of the CBD Tolling Alternative would not be substantial. It would be about 2 percent or less within New York City based on the assumptions above for stations within the Manhattan CBD. According to Long Island Rail Road and Metro-North Railroad data, less than 1 percent of commuters bike to their stations, Although the BPM cannot predict such activity, a small proportion of commuters would shift from automobiles to bicycles for their daily trips, depending on distance, available bicycle facilities, comfort, and other factors. Therefore, the total additional bicycle trips associated with the CBD Tolling Alternative would not result in any adverse effects on bicycle operations outside the Manhattan CBD.

4E.4 VEHICULAR AND PEDESTRIAN SAFETY

4E.4.1 Methodology

Pursuant to methodologies outlined in the *CEQR Technical Manual*, vehicular and pedestrian safety assessments were prepared for the same intersections for which detailed pedestrian analyses were conducted, adjacent to the areas of Herald Square/Penn Station New York and World Trade Center/Fulton Street. Crash data were obtained from NYCDOT for the most recent three-year period for which data are available (January 1, 2015, to December 31, 2017). The data quantify the total number of reportable crashes (defined as involving fatality, injury, or more than $1,000 in property damage), as well as a yearly breakdown of vehicular crashes with pedestrians and bicycles at each location.

Additionally, the curb pedestrian ramps at the corners selected for detailed analysis were assessed based on the Americans with Disabilities Act (ADA) regulations. The direction, location, and type of corner pedestrian ramps were evaluated to identify if the ramps meet minimum ADA compliance.

4E.4.2 Affected Environment

During the 2015–2017 period, the crash data reveals that 167 reportable crashes, consisting of 1 fatality, 116 injuries, and 63 pedestrian/bicyclist-related crashes occurred at the intersections in the areas of Herald Square/Penn Station New York and World Trade Center/Fulton Street. A rolling total of crash data[10] identifies three high-crash locations:

- West 34th Street at Eighth Avenue
- West 34th Street at Seventh Avenue
- West 34th Street at Sixth Avenue/Broadway

Each of these intersections experience high pedestrian volumes throughout the day.

To assess minimum ADA compliance of curb pedestrian ramps in the affected environment, observations were conducted using street view images captured in July and August 2021. At the northwest, northeast,

[10] As described in Appendix 4E, "Transportation: Supporting Documentation for Pedestrian Analyses," high-crash locations are defined as locations where 48 or more total reportable and non-reportable crashes or five or more pedestrian/bicyclist injury crashes occurred in any consecutive 12 months of the most recent three-year period for which data are available. NYCDOT crash data does not contain non-reportable crashes, which make up a negligible portion of intersection crashes, because nearly all involve property damage exceeding $1,000 or an injury or fatality.

and southwest corners of Eighth Avenue and West 34th Street, northeast corners of Sixth Avenue and West 34th Street and Seventh Avenue and West 32nd Street, and northwest corner of Broadway and Liberty Street, none of the curb pedestrian ramps meet minimum ADA compliance. Additional information is provided in **Appendix 4E, "Transportation: Supporting Documentation for Pedestrian Analyses."** NYCDOT has an ongoing Pedestrian Ramp Program,[11] which is dedicated to upgrading and installing pedestrian ramps throughout New York City.

Appendix 4E, "Transportation: Supporting Documentation for Pedestrian Analyses," shows the total crash characteristics by intersection, as well as a breakdown of pedestrian and bicycle crashes by year and location. For the three high-crash locations, an examination of each pedestrian/bicyclist-related incident was conducted, along with a field audit of each intersection's geometric and operational conditions. These efforts, as detailed in **Appendix 4E, "Transportation: Supporting Documentation for Pedestrian Analyses,"** showed that causes for the recorded crashes vary and are mostly attributed to inattentiveness of and failure to yield—by motorists but also by pedestrians and bicyclists. As part of the City of New York's Vision Zero[12] initiative, many additional safety measures have been added to roadways and intersections across New York City.

4E.4.3 Environmental Consequences

NO ACTION ALTERNATIVE

In the No Action Alternative, there would not be a vehicular tolling program, and any changes in safety conditions at high-crash intersections or non-compliant ADA curb pedestrian ramps would likely result from changes in activity resulting from background growth or new development in an area.

CBD TOLLING ALTERNATIVE

The CBD Tolling Alternative would result in slight increases in pedestrian volumes at the three identified high-crash locations. The Project would not exacerbate safety concerns at the locations, which already experience high pedestrian volumes throughout the day. The CBD Tolling Alternative would also not result in substantial increases in pedestrian volumes or exacerbate safety concerns at other locations in the Manhattan CBD that do not already experience high pedestrian volumes throughout the day. Three locations near Herald Square could realize a degradation in the LOS because of the CBD Tolling Alternative, but the widening of a sidewalk through the removal of sidewalk obstructions and the widening of two crosswalks will address this potential degradation in the LOS. The CBD Tolling Alternative would not result in substantially modified geometric or operational traffic, pedestrian, or bicycle conditions, with or without recommended improvement measures, which would therefore not exacerbate safety concerns. Also, because of fewer vehicular trips entering and exiting the Manhattan CBD, the CBD Tolling Alternative could result in reduced traffic volumes at these locations. This would help to reduce vehicle-vehicle and vehicle-pedestrian conflicts, leading to an overall benefit to safety. Therefore, the CBD Tolling Alternative would not result in any adverse effects on vehicular, pedestrian, and bicycle safety, and mitigation measures to address vehicular, pedestrian, and bicycle safety are not necessary.

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11 https://www1.nyc.gov/html/dot/html/pedestrians/pedramps.shtml.

12 https://www1.nyc.gov/content/visionzero/pages/.

4E.5 CONCLUSION

Using methodology presented in the *CEQR Technical Manual*, a detailed assessment of increases in pedestrian activity was warranted for areas around the Herald Square/Penn Station New York and World Trade Center/Fulton Street transit hubs in Manhattan.

- Herald Square/Penn Station New York in Midtown Manhattan where Penn Station New York (Amtrak and commuter rail), three subway stations serving multiple subway routes, a Port Authority Trans-Hudson (PATH) station, and commuter and local bus routes are located

- World Trade Center/Fulton Street in Lower Manhattan where a PATH station, multiple subway stations serving multiple subway routes, and local bus routes are located

Based on detailed analysis of the pedestrian elements at these locations that would experience more than 200 new peak-hour trips, there would be no adverse effect on pedestrian circulation except at three locations in the Harold Square/Penn Station study area. These effects would occur at two crosswalks on one sidewalk, and they will be mitigated with measures that are routinely implemented throughout the city. The Project Sponsors will monitor the affected locations before and after completion of the Project to validate the analysis results and will implement the necessary mitigation to alleviate adverse effects.

The bicycle network is well established within and around the Manhattan CBD, and additional bicycle trips generated by the Project would be negligible compared to the magnitude of existing bicycle use adjacent to transit station complexes. Therefore, the CBD Tolling Alternative would not result in any adverse effects on bicycle operations.

The CBD Tolling Alternative would not exacerbate safety concerns at the three identified high-crash locations within the study area, nor would it exacerbate safety concerns at other locations within or outside the Manhattan CBD that do not already experience high pedestrian volumes throughout the day. The CBD Tolling Alternative would not result in substantially modified geometric or operational traffic, pedestrian, or bicycle conditions that would exacerbate safety concerns. Because fewer vehicular trips would be entering and exiting the Manhattan CBD, the CBD Tolling Alternative could result in reduced traffic volumes at these locations, which could reduce vehicle-vehicle and vehicle-pedestrian conflicts, leading to an overall increase in safety.

Table 4E-5 summarizes the effects of the CBD Tolling Alternative on pedestrians and bicycles***[, and Table 4E-6 summarizes how mitigation measures will be implemented by the Project Sponsors]***.

Table 4E-5. Summary of Effects of the CBD Tolling Alternative on Pedestrians and Bicycles

TOPIC	SUMMARY OF EFFECTS	EFFECT FOR ALL TOLLING SCENARIOS	POTENTIAL ADVERSE EFFECT	MITIGATION AND ENHANCEMENTS
Pedestrian Circulation	Increased pedestrian activity on sidewalks outside transit hubs because of increased transit use. At all but one location in the Manhattan CBD (Herald Square/Penn Station), the increase in transit riders would not generate enough new pedestrians to adversely affect pedestrian circulation in the station area. Outside the Manhattan CBD, transit usage at individual stations would not increase enough to adversely affect pedestrian conditions on nearby sidewalks, crosswalks, or corners.	Adverse effects on pedestrian circulation at one sidewalk segment and two crosswalks	Yes	Mitigation needed. [C OT] will implement a monitoring plan at this location. The plan will include a baseline, specific timing, and a threshold for additional action. If that threshold is reached, [C OT] will increase pedestrian space on sidewalks and crosswalks via physical widening and/or removing or relocating obstructions.
Bicycles	Small increases in bicycle trips near transit hubs and as a travel mode, both inside and outside the Manhattan CBD	Small increases in bicycle trips near transit hubs with highest increases in pedestrian trip share; some shifts from automobiles to bicycles	No	No mitigation needed. No adverse effects
Safety	No adverse effects	No substantial increases in pedestrian volumes or increased safety concerns, including at existing identified high-crash locations. Overall, fewer vehicular trips entering and exiting the Manhattan CBD, the CBD Tolling Alternative could result in reduced traffic volumes at these locations. This would help to reduce vehicle-vehicle and vehicle-pedestrian conflicts, leading to an overall benefit to safety.	No	No mitigation needed. No adverse effects

[Table 4E-6. Summary of the CBD Tolling Alternative Implementation Approach for Mitigation and Enhancement Measures for Pedestrians and Bicycles]

RELEVANT LOCATION(S)	DESCRIPTION OF MITIGATION	TIMELINE FOR PRE- AND POST-PROJECT IMPLEMENTATION DATA COLLECTION FOR SPECIFIC MEASURES	THRESHOLD FOR DETERMINING WHEN NEXT STEP(S) WILL BE IMPLEMENTED	TIMING FOR SPECIFIC MEASURES	LEAD AGENCY
Herald Square/Penn Station NY	NYCDOT will implement a monitoring plan at this location. The plan will include a baseline, specific timing, and a threshold for additional action. If that threshold is reached, NYCDOT will increase pedestrian space on sidewalks and crosswalks via physical widening and/or removing or relocating obstructions.	Exact timing will be based on seasonality and other factors such as construction activity. Baseline data will be collected within the six months prior to Project implementation. Post-implementation data will be collected within the first year after Project implementation.	An additional 221 pedestrians per hour (pph) during the weekday AM peak hour or 204 pph during the PM peak hour along the west sidewalk of Eighth Avenue between West 34th and West 35th Streets, 265 pph during the AM peak hour or 259 pph during the PM peak hour on the north crosswalk at Sixth Avenue and West 34th Street, and/or 221 pph during the AM peak hour on the north crosswalk at Seventh Avenue and West 32nd Street. The methods of data collection and evaluation will follow standard practices pursuant to guidelines of the CE R echnical Manual and will be coordinated with NYCDOT.	Within 90 days of observing pedestrian counts in excess of the threshold for next steps.	NYCDOT will lead.

5. Social Conditions

This chapter provides an overview of social conditions for the New York City region, the Manhattan CBD, and the neighborhoods where implementation of the CBD Tolling Alternative would have potential environmental consequences related to population characteristics and community cohesion, neighborhood character, and current public policy. This chapter relies on data from **Chapter 4, "Transportation,"** to evaluate the effects of predicted changes in travel behavior resulting from the CBD Tolling Alternative on social conditions.

To present the wide range of topics related to social conditions, the chapter is broken into three subchapters:

- **Subchapter 5A, "Social Conditions: Population Characteristics and Community Cohesion"**
- **Subchapter 5B, "Social Conditions: Neighborhood Character"**
- **Subchapter 5C, "Social Conditions: Public Policy"**

This and other chapters of this EA (in particular **Chapters 2, 3, 6, 15, 17, and Subchapters 4A, 4B, 4C, 4E, 5B, and 5C**) collectively provide information relevant to FHWA's guidance for a Community Impact Assessment.[1] The information is presented in this EA rather than in a stand-alone Community Impact Assessment report, and **Appendix 5A, "Social Conditions: Community Impact Assessment Summary Matrix,"** presents a matrix showing the elements of a Community Impact Assessment and where they can be found in this EA.

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1 FHWA. 2018 Update. FHWA-PD-96-036. *Community Impact Assessment: A Quick Reference for Transportation*. www.fhwa.dot.gov/livability/cia/quick_reference/ciaguide_053118.pdf.

5A. Population Characteristics and Community Cohesion

5A.1 INTRODUCTION

This subchapter assesses whether changes to population characteristics or travel patterns resulting from implementation of the CBD Tolling Alternative would affect community cohesion, community facilities and services, and access to employment. It also evaluates the effects of the CBD Tolling Alternative on certain vulnerable social groups, including elderly populations, persons with disabilities, transit-dependent populations, and nondriver populations. **Chapter 17, "Environmental Justice,"** presents an evaluation of the Project's effects on low-income and minority populations and an analysis of whether the Project would result in disproportionately high and adverse effects on minority and low-income populations in accordance with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations."

5A.2 METHODOLOGY

5A.2.1 Analysis Framework

FHWA's Technical Advisory T6640.8A provides guidance on the content of environmental documents prepared pursuant to NEPA and FHWA's procedures that implement NEPA.[2] In addition, FHWA's *Community Impact Assessment: A Quick Reference for Transportation* (Community Impact Assessment guidance) provides information on how to conduct a Community Impact Assessment and guidance on analyzing community impacts for transportation actions.[3] The Project Sponsors followed the guidance in these documents in preparing the analysis in this chapter. FHWA's Technical Advisory T6640.8A identifies categories of resources that project sponsors should consider when assessing the environmental consequences of their undertakings, and the Community Impact Assessment guidance identifies types of community impacts to consider.

Consistent with FHWA Technical Advisory T66040.8A and the FHWA Community Impact Assessment guidance, this subchapter provides an overview of key population characteristics in the New York City region and evaluates potential effects on community cohesion, community facilities and services, certain social groups, and access to employment.

Community cohesion is the degree to which groups of people with shared attributes or affinities—such as cultural, religious, artistic, or activity-based communities—can form and maintain communities that are not limited to any particular location or neighborhood. Community cohesion is usually expressed as a "sense of belonging" or a level of commitment to a community, or a strong attachment to neighbors,

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2 FHWA. October 30, 1987. FHWA Technical Advisory T6640.8A, "Guidance for Preparing and Processing Environmental and Section 4(f) Documents." www.environment.fhwa.dot.gov/legislation/nepa/guidance_preparing_env_documents.aspx#aa.

3 FHWA. 2018 Update. FHWA-PD-96-036. *Community Impact Assessment: A Quick Reference for Transportation.* www.fhwa.dot.gov/livability/cia/quick_reference/ciaguide_053118.pdf.

groups, and institutions, usually because of continued appreciation over time. FHWA Technical Advisory T66040.8A defines potential effects on community cohesion as, "[c]hanges in the neighborhoods or community cohesion for the various social groups as a result of the proposed action. These changes may be beneficial or adverse, and may include splitting neighborhoods, isolating a portion of a neighborhood or an ethnic group, generating new development, changing property values, or separating residents from community facilities, etc."[4] In addition, the FHWA Community Impact Assessment guidance identifies types of community impacts, including displacement of residents and adverse effects on public facilities. As such, this subchapter also considers Project effects related to the potential for residential displacement and effects on community facilities and services—such as public or publicly funded schools, libraries, childcare centers, health care facilities, and fire and police protection.

Consistent with FHWA Technical Advisory T66040.8A, this subchapter also addresses potential effects on certain social groups, such as elderly populations, persons with disabilities, transit-dependent populations (those who use transit as their primary mode for some or all trips, irrespective of vehicle ownership), and nondriver populations. Changes in travel patterns and accessibility can affect these population sub-groups as they may rely on certain modes of transportation or certain accessibility patterns.

5A.2.2 Study Area

The analysis of social conditions in this subchapter considers potential effects of the No Action Alternative and CBD Tolling Alternative on the 28-county region and the Manhattan CBD. The 28-county regional study is shown in **Figure 5A-1** and described in **Chapter 3, "Environmental Analysis Framework."** It includes New York City and the surrounding region, which represents the primary catchment area for trips to and from the Manhattan CBD.

5A.2.3 Data Sources

Unless otherwise noted, information on population characteristics is based on the U.S. Census Bureau's 2015–2019 American Community Survey (ACS) 5-Year Estimates. The evaluation of the Project's effects on these population characteristics is based on the results of comprehensive regional transportation modeling conducted for the Project as described in **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling."**

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4 FHWA. October 30, 1987. FHWA Technical Advisory T6640.8A, "Guidance for Preparing and Processing Environmental and Section 4(f) Documents." www.environment.fhwa.dot.gov/legislation/nepa/guidance_preparing_env_documents.aspx#aa.

5A.3 AFFECTED ENVIRONMENT

5A.3.1 Regional Context

The New York City metropolitan region is a very large and diverse area of some 12,500 square miles and a regional population of about 22.2 million residents. New York City is the center of the regional study area, which includes portions of three states—New York, New Jersey, and Connecticut—and is home to approximately 22.2 million residents according to the 2015–2019 ACS. **Figure 5A-1** shows the regional study area, with the five counties of New York City at the center, two counties to the east on Long Island, seven counties to the north of New York City in New York and Connecticut, and 14 counties to the west and south in New Jersey. The study area extends approximately 170 miles from east to west and approximately 175 miles from north to south. The region reflects a high level of social and economic diversity and its development patterns range from dense urban core areas in and around New York City to lower density suburban communities and low-density exurban areas.

The regional study area has a wide range of population densities, land uses, and development densities reflecting the long history of settlement patterns, the regional transportation network, and the location of the region's cities, communities, and neighborhoods. Other than large tracts of open space or lands owned by the State or Federal government, there are no unincorporated areas and there are more than 700 incorporated municipalities (boroughs, villages, towns, and cities) within the 28 counties of the regional study area. These incorporated municipalities range from small boroughs and villages—often with fewer than 5,000 residents, larger townships and towns, subregional urban areas, and cities. Large or small, these communities generally provide for essential community facilities and services and maintain their own planning, zoning, and development controls that define the character of the community. New York City is the urban center with its 8.4 million residents and, after New York City, the next largest city in the region is Newark in Essex County, New Jersey, with a population of approximately 281,000, followed by Jersey City in Hudson County, New Jersey, and Yonkers in Westchester County, New York, with populations of 262,000 and 200,000, respectively.

New York City is the most densely populated city in the United States.[5] As shown in **Figure 5A-2**, four of its five boroughs (counties)—the Bronx, Brooklyn, Manhattan, and Queens—are densely populated; in addition, the adjacent county across the Hudson River in New Jersey, Hudson County, is also densely populated. Other counties in the regional study area are more suburban in character, and density decreases at greater distance from New York City. New York City's population of 8.4 million people is approximately 38 percent of the regional population and yet its combined land area of 423 square miles represents only about 3.4 percent of the total land area of the region. The 28-county region is a mature metropolitan region with a long history of development patterns that are reflected in its transportation network and its population distribution.

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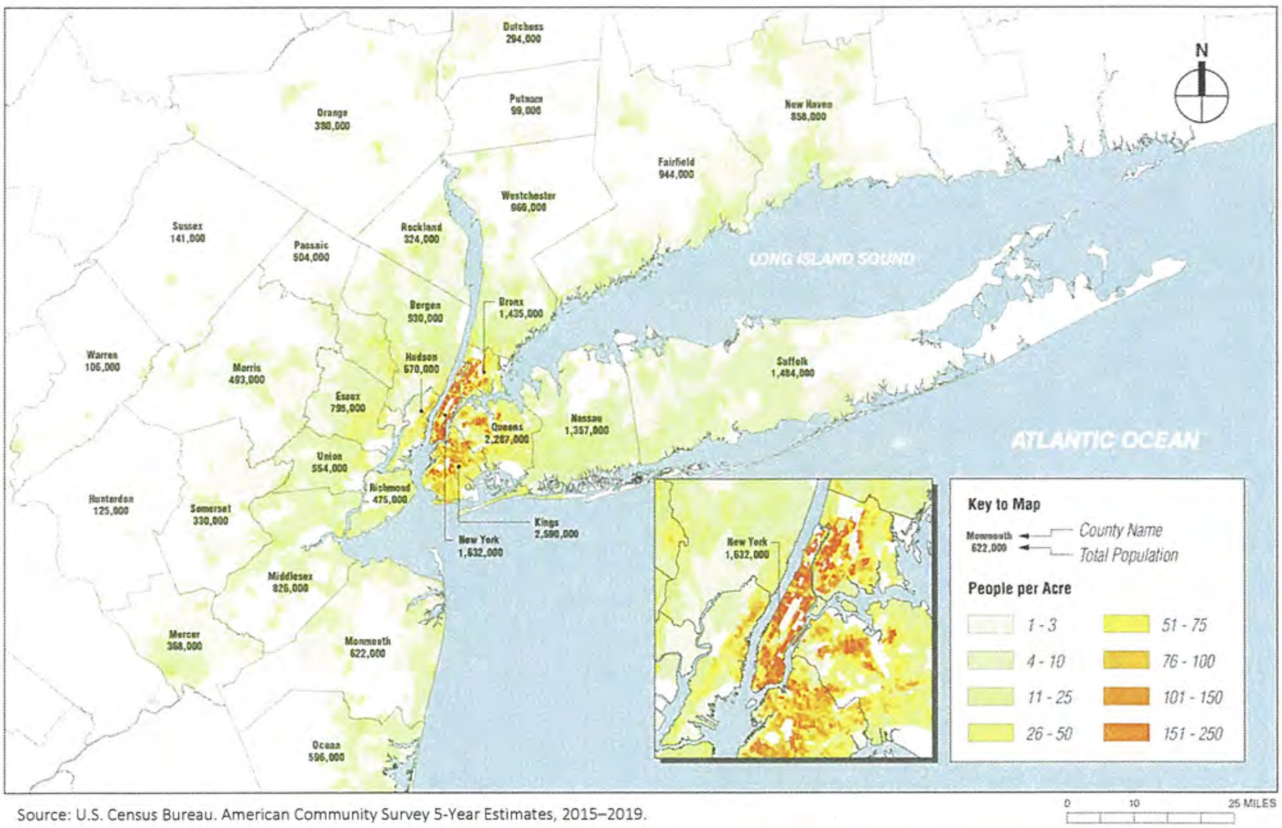
5 New York City Department of City Planning. www1.nyc.gov/site/planning/planning-level/nyc-population/newest-new-yorkers-2013.page.

Figure 5A-1. Regional Study Area

Source: ArcGIS Online, https://www.arcgis.com/index.html.

Figure 5A-2. Population and Density



Source: U.S. Census Bureau. American Community Survey 5-Year Estimates, 2015–2019.

[Note: For an audio description, please go to the following link: https://www.youtube.com/watch?v=rO8TIuBPBBA&list=PLZHkn788ZQJPEY5zv-dr2gzkzMQFMgb_2&index=4.]

The region has a dense transportation network of highways and public transportation, including commuter rail, subway, light rail, buses, and ferries. Because New York City, and particularly Manhattan, has long been the economic center of the region, the transportation network is predominantly oriented to providing connections to and from Manhattan and New York City overall. Transportation links to Manhattan include the roads and highways that lead to and from the tunnels and bridges linking Manhattan to the region. The historic transportation patterns are most notable in the legacy infrastructure of fixed transportation routes (railroads, subways, and ferries) that connect the region to the city, and all five boroughs of New York City to the Manhattan CBD. The level of density in the urban core is reflected in the extensive transit network, frequent service throughout the region, and 24-hour service on the New York City subway and bus system. As depicted on **Figure 5A-3,** nearly all areas of New York City are within a half-mile of subway, commuter rail, Select Bus Service (SBS), or express bus service. One-half mile represents an approximately 10-minute walk for an average pedestrian, and therefore indicates the availability of these transportation services. In addition, New York City has a very dense local bus network, and all areas of the city are within a half-mile of a local bus stop other than one neighborhood in Queens (Breezy Point, a gated community in southern Queens). As discussed in **Section 5A.3.4**, most people use public transportation to travel to and from the Manhattan CBD.

Farther from New York City, the suburban and exurban areas of the regional study area have commuter rail and bus service that lead to New York City, with towns centered around commuter rail stations, but also include a more decentralized road network serving the greater region that developed as the region grew with a more auto-oriented development pattern. The highway network includes roads that do not connect to New York City at all as well as circumferential highways such as I-95, I-287, and I-84 that pass through New York City but largely bypass the Manhattan CBD. The expansion of the larger and decentralized highway network but the limited roadway capacity of the historic links to, from, and within Manhattan is reflected in the chronic congestion in Manhattan as described in **Chapter 1, "Introduction."**

At the hub of the regional study area, the Manhattan CBD is the traditional economic center of the region. It extends almost 5 miles from the tip of Lower Manhattan on the south to 60th Street on the north, and approximately 2 miles from the Hudson River on the west to the East River on the east. The Manhattan CBD includes the densely developed commercial areas of Lower Manhattan and Midtown Manhattan as well as residential neighborhoods within and around these business-oriented areas. **Subchapter 5B, "Social Conditions: Neighborhood Character,"** provides more detailed discussion of the neighborhoods and geographic areas of the Manhattan CBD.

Other areas of New York City are connected to the Manhattan CBD through the city's extensive transit system, which carries 85 percent of daily commuter trips to and from the Manhattan CBD, as well as by bridges and tunnels connecting the road and highway network to Manhattan. One of the city's five boroughs, Staten Island, is more geographically isolated from the rest of New York City, and is connected by highway bridges to Brooklyn and New Jersey (which carry express buses between Staten Island and Manhattan) and is linked to Manhattan by the iconic Staten Island Ferry. Staten Island is more suburban in character than other parts of New York City with less racial and ethnic diversity than the rest of New York City, and a housing stock with lower density.

Figure 5A-3. New York City Areas Within and Beyond One-Half Mile of Rail Stations, Subway Stations, or Express Bus and Select Bus Service Stops

Subway/Commuter Rail Station

Express Bus / Select Bus Service (SBS) Stop

Area Within 1/2 mile from Subway/Rail Station or Express/SBS Bus Stop

Area More than 1/2 mile from Subway/Rail Station or Express/SBS Bus Stop

Area More than 1/2 mile from Subway/Rail Station or Express/SBS Bus Stop from Which There Are No Car Commuters to the CBD (Many of these are parks, cemeteries, or airports)

Area More than One-Half Mile from Local Bus Stop

Source: U.S. Census Bureau. Census Transportation Planning Package (CTPP), 2012–2016 Estimate.

5A.3.2 Community Cohesion

Community cohesion is the degree to which groups of people with shared attributes or affinities—such as cultural, religious, artistic, or activity-based communities—can form and maintain communities that are not limited to any particular location or neighborhood. Community cohesion and civic life in the regional study area are organized around neighborhoods and communities, including the 700 communities that surround New York City and the hundreds of neighborhoods within New York City that reflect the diversity of the city's population. The regional study area has a wide range of geographic, cultural, religious, artistic, and activity-based communities spread throughout the region, with varying levels of economic, social, and cultural ties to the Manhattan CBD. As distances increase from the Manhattan CBD, fewer residents have direct and daily interactions with the Manhattan CBD, as evidenced by the smaller numbers and proportions of daily commuters to the Manhattan CBD (discussed in **Section 5A.3.4**).

The region's transportation network, including its roadways, sidewalks, and public transportation services, is essential to connecting the communities that define the region, allowing the mobility to access its urban centers, centers of government, cultural institutions, and, most importantly, places of employment. This is particularly true for the Manhattan CBD, which has large share of the region's jobs. As described in more detail in **Chapter 6, "Economic Conditions,"** a meaningful connection to the Manhattan CBD for many people is that it is their place of work. The scale of the social connections in the region and the transportation demands to maintain those connections are immense. According to the 2010/2011 Regional Household Travel Survey, there are approximately 80 million individual trips in the region on an average weekday. Approximately one-third of all daily trips are made for social/recreational purposes, shopping, or school, and approximately one-quarter of all daily trips are for work purposes.[6]

There are thousands of places of worship for many different religions throughout the region, and these remain important local neighborhood anchors not particularly tied to or dependent on regional mobility. In and around the Manhattan CBD, there are similarly dispersed neighborhood places of worship as well as important regional institutions that draw local and regional visitors as well as tourists and visitors from outside the region. Some notable examples include St. Patrick's Cathedral, Trinity Church, Central Synagogue, Othman bin Affan Masjid (Islamic Society of Mid Manhattan), St. Vartan Armenian Cathedral, the Mahayana Buddhist Temple, and many others.[7] In total, the Manhattan CBD has approximately 200 places of worship.[8] Places of worship typically are accessible by transit, and most do not have on-site visitor parking given the densely developed nature of the Manhattan CBD, which indicates that travel by vehicle is not the predominant mode of transportation for their worshippers.

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6 Trip purpose categories included "Work," "School," Social/Recreational," "Shopping," and "Other;" more detailed options comprising "Other" included "Personal Business," "Home to Serving Passengers/Serving Passengers to Home," and "Other." New York Metropolitan Transportation Council and New Jersey Transportation Planning Authority. October 2014. 2010/2011 Regional Household Travel Survey. www.nymtc.org/portals/0/pdf/RHTS/RHTS_FinalExecSummary10.6.2014.pdf.

7 The U.S. Census Bureau does not collect data on religious affiliation in its demographic surveys or decennial census; therefore, data on the population of different religious affiliations in the Manhattan CBD is not available from the census.

8 Based on a review of ArcGIS Online, https://www.arcgis.com/index.html, in combination with Google maps.no com.

5A.3.3 Community Facilities and Services

Community facilities include schools, libraries, childcare centers, health care facilities, and police and fire protection. Throughout the region, most community facilities are locally focused, serving their individual communities, although some have a larger regional draw. Other facilities, such as homeless shelters, food pantries and meal distribution services, jails, community centers, colleges and universities, and religious and cultural facilities, are also community facilities and services and these serve a broader regional need.

5A.3.3.1 LIBRARIES

There are some 200 branch libraries in New York City and hundreds more in individual communities in the region. The region includes some major, central libraries, such as the main library of the New York Public Library system within the Manhattan CBD and the main library of the Brooklyn Public Library system outside the Manhattan CBD, as well as many smaller libraries throughout the region. The regional libraries, like other large cultural institutions with a regional draw, attract visitors with specific needs (i.e., research projects or other specialized tasks).

5A.3.3.2 SCHOOLS

Similarly, schools are decentralized and located throughout the city and region, serving their local communities. In New York City, the New York City Department of Education (NYCDOE) provides transportation to all eligible New York City students in public, charter, and non-public schools. NYCDOE transportation services vary by school and each child's eligibility for those services. In general, NYCDOE provides student MetroCards for students living more than one-half mile from their school, and may provide yellow school bus service, depending on the age of the student, distance to school, and the student's disability status.[9] Many students, especially those in Manhattan where school catchment zones are small given the population density, walk or take transit to school.

The Manhattan CBD includes approximately 125 public schools serving some 60,000 students, as well as charter schools and private and parochial schools. Based on recent surveys conducted by the NYCDOE, approximately 8 percent of the public school students who live within the Manhattan CBD use school buses to get to school; the rest use public transit, walk, or bicycle to school.

5A.3.3.3 MEDICAL FACILITIES

Like other services in a community, health clinics, urgent care, doctors' offices, and community hospitals are present throughout the regional study area and typically serve their local communities. The 28-county study area also has healthcare facilities, including specialists and hospitals, with a larger, regional (and, in some cases, national and international) draw because of the specialty services they provide. Some of these are within the Manhattan CBD and others are outside. For example, specialty hospitals and associated doctors' offices are located throughout Manhattan, including within the Manhattan CBD on the east side

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9 MetroCard is the primary payment method for the New York City subway and New York City and MTA buses. Student MetroCards are distributed by schools to students whose home is one-half mile or farther from their school. These MetroCards allow three free rides each school day between 5:30 a.m. and 8:30 p.m., including free transfers between buses or between the subway and local, limited, and SBS buses.

between East 14th and East 34th Street and outside the Manhattan CBD on the Upper East Side (generally between East 68th and East 106th Streets).

Some people may travel by vehicle from locations outside the Manhattan CBD or by vehicle within the Manhattan CBD to access these facilities. In addition, some residents of the Manhattan CBD may travel by vehicle to access medical facilities outside the Manhattan CBD.

The rate of vehicle use to access medical facilities depends in part on the facilities' distance to a subway station or bus route (as well as other factors, including the patient's mobility and the type of medical service sought). For medical office uses within one-quarter mile of a subway station, approximately 6 percent of trips to these uses are by auto or taxi/FHV modes, according to data from NYCDOT's mode choice surveys. For medical office uses that are beyond one-quarter mile from a subway station, approximately 14 percent of trips are by auto or taxi/FHV modes. Therefore, most medical trips, even those to facilities more than one-quarter mile from a subway station, are made by modes other than auto or taxi/FHV. Several major medical facilities in Manhattan are more than one-quarter mile from a subway station, including New York University Langone Medical Center, the Veterans' Administration New York Harbor Healthcare System, and Bellevue Hospital Center in the Manhattan CBD.

5A.3.3.4 OTHER FACILITIES

Other facilities, such as homeless shelters, food pantries and meal distribution services, jails, community centers, colleges and universities, and religious and cultural facilities, are also community facilities and services. These serve both a local and a broader regional need.

5A.3.4 Population Characteristics and Protected Social Groups

This section summarizes key population characteristics in the regional study area and identifies social groups that are the focus of this analysis: elderly populations, persons with disabilities, transit-dependent populations (those who use transit as their primary mode for some or all trips, irrespective of vehicle ownership), and nondriver populations.

The 28-county regional study area has approximately 22.2 million residents. As shown in **Figure 5A-2** and detailed in **Table 5A-1**, approximately 38 percent of these residents live in New York City; and almost 20 percent in the four closest New Jersey counties (Bergen, Essex, Hudson, and Union) and Nassau County, just east of New York City.

The population of the regional study area has grown by 5 percent since 2000, with New York City adding more than 410,000 people and accounting for 37 percent of that growth. Brooklyn saw the largest population gain in the region, with almost 126,000, followed by the Bronx (102,000), and Manhattan (95,000). Population projections prepared by the New York Metropolitan Transportation Council (NYMTC), the regional Metropolitan Planning Organization (MPO) for the New York City region, projects continued

growth in the region, with the population projected to exceed 25 million by 2045. New York City's population is projected to surpass 9 million by 2045.[10]

Table 5A-1. Population Characteristics of the Regional Study Area

GEOGRAPHIC AREAS	TOTAL POPULATION	MINORITY	LOW-INCOME	AGE 65 AND OLDER	WITH AMBULATORY DIFFICULTY	HOUSEHOLDS WITH NO ACCESS TO A VEHICLE
New York City	8,419,316	67.9	36.0	14.5	7.0	54.6
Bronx County	1,435,068	90.9%	51.0%	12.5%	9.5%	59.1%
Kings County (Brooklyn)	2,589,974	63.6%	39.1%	13.6%	7.0%	55.8%
New York County (Manhattan)	1,631,993	53.1%	28.9%	16.2%	6.5%	77.0%
Queens County	2,287,388	75.0%	31.0%	15.3%	6.2%	36.7%
Richmond County (Staten Island)	474,893	39.0%	23.0%	16.0%	6.2%	16.7%
Long Island Counties	2,840,341	36.1	15.6	17.0	5.1	6.0
Nassau County	1,356,509	40.0%	14.5%	17.5%	4.7%	6.9%
Suffolk County	1,483,832	32.4%	16.7%	16.5%	5.2%	5.2%
New York Counties North of New York City	2,065,938	39.3	22.3	16.0	5.7	11.7
Dutchess County	293,754	28.5%	21.4%	17.1%	6.7%	7.8%
Orange County	380,085	35.8%	25.8%	13.7%	6.7%	9.8%
Putnam County	98,787	21.3%	12.7%	16.8%	5.4%	4.9%
Rockland County	324,422	36.9%	28.3%	15.6%	4.8%	10.7%
Westchester County	968,890	46.5%	20.2%	16.7%	5.3%	14.5%
New Jersey Counties	7,060,811	46.8	22.5	15.7	5.5	12.3
Bergen County	930,390	43.4%	16.1%	17.0%	4.6%	8.3%
Essex County	795,404	69.5%	33.3%	13.5%	6.5%	22.4%
Hudson County	670,046	71.2%	32.8%	11.8%	5.8%	32.6%
Hunterdon County	124,823	14.5%	10.7%	17.9%	3.7%	3.4%
Mercer County	367,922	50.3%	25.0%	15.0%	5.5%	11.2%
Middlesex County	825,920	56.9%	19.4%	14.7%	5.4%	8.0%
Monmouth County	621,659	24.8%	16.3%	17.2%	5.9%	6.9%
Morris County	493,379	28.6%	12.4%	16.8%	4.5%	4.7%
Ocean County	596,415	15.3%	24.8%	22.5%	7.6%	6.3%
Passaic County	503,637	58.7%	32.8%	14.3%	5.1%	16.6%
Somerset County	329,838	43.7%	12.1%	15.3%	4.1%	4.9%
Sussex County	141,483	13.7%	13.6%	16.7%	5.7%	3.5%
Union County	554,033	60.5%	24.8%	14.2%	5.1%	11.8%
Warren County	105,862	18.3%	19.1%	17.6%	6.9%	6.4%
Connecticut Counties	1,801,439	37.7	23.1	16.2	5.5	9.6
Fairfield County	943,926	38.3%	20.8%	15.6%	5.1%	7.8%
New Haven County	857,513	37.1%	25.6%	17.0%	6.2%	11.6%
TOTAL	22,187,845	52.0	26.8	15.4	6.0	27.9

Source: U.S. Census Bureau, American Community Survey (ACS) 2015–2019 5-Year Estimates.
Note: Low-income residents are those with household incomes of up to 1.99 times the Federal poverty level.

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[10] New York Metropolitan Transportation Council. 2015. 2050 Socioeconomic and Demographic Forecasts. www.nymtc.org/DATA-AND-MODELING/SED-Forecasts/2050-Forecasts.

According to the U.S. Census Bureau 2015–2019 ACS 5-Year Estimates, 52 percent of the regional study area's population is minority. Some 67.9 percent of New York City's population identifies as minority and 53.7 percent of the combined residents of the four closest New Jersey counties (Bergen, Essex, Hudson, and Union) and Nassau County are minority. An estimated 26.8 percent of the population in the regional study area have a household income that can be considered low-income.[11] In New York City as a whole, approximately 36.0 percent of the population is low-income and 22.4 percent of the combined population in the four closest New Jersey counties and Nassau County is low-income. Overall, in the New York counties north of New York City, Long Island, and the portions of New Jersey and Connecticut outside of New York City that comprise the remainder of the regional study area, the proportion of minority residents ranges from 13.7 percent to 69.5 percent, with the lowest numbers in the less densely populated New Jersey counties farthest from New York City. Approximately 10.7 percent to 33.3 percent of the population of the counties outside New York City is low-income. **Appendix 5B, "Social Conditions: Supplemental Demographic Information for the Regional Study Area and Manhattan CBD,"** and **Chapter 17, "Environmental Justice,"** provide additional demographic information regarding minority status and income characteristics for the Manhattan CBD and regional study area, respectively.

In the regional study area, approximately 10 percent of the noninstitutionalized population has a disability and approximately 6 percent of the noninstitutionalized population age 5 and older is disabled with ambulatory difficulty.[12] The counties with the highest percentages of population with ambulatory difficulty are Bronx County at 9.5 percent (compared to 6.4 percent in New York State overall) and Ocean County at 7.6 percent (compared to 5.5 percent in New Jersey overall).

About 15 percent of the population in the regional study area is 65 years old or older, representing a 29 percent increase in this age group since the year 2000. Throughout the regional study area, approximately 12 percent to 23 percent of each county's population is 65 years or older; Ocean County, New Jersey, has the highest percentage of elderly residents at 23 percent. Across the regional study area, approximately 22 percent of the population is youth (age 0 to 17) and approximately 63 percent is working age (age 18 to 64).

Roughly 28 percent of households in the regional study area do not have a vehicle available for their use (and, conversely, 72 percent of households have one or more vehicles available), although vehicle access varies widely across the region, as shown in **Table 5A-1** and **Figure 5A-4**.[13] As would be expected given the urban densities of New York City, the proportion of households that do not have access to a vehicle is substantially higher in Manhattan (77 percent in the county as a whole, 80 percent in the Manhattan CBD),

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11 As described in **Chapter 17, "Environmental Justice,"** low-income residents are those with household incomes of up to 1.99 times the Federal poverty level.

12 This census category is defined as "having serious difficulty walking or climbing stairs." This community may depend on vehicular transportation and would have challenges switching to public transit.

13 This discussion relies on data on "Vehicles Available" from the 2015-2019 ACS. These data show the number of passenger cars, vans, and pickup or panel trucks of one-ton (2,000 pounds) capacity or less kept at home and available for the use of household members. Vehicles rented or leased for one month or more, company vehicles, and police and government vehicles are included if kept at home and used for nonbusiness purposes. Motorcycles or other recreational vehicles are excluded. Dismantled or immobile vehicles are excluded. Vehicles kept at home but used only for business purposes also are excluded.

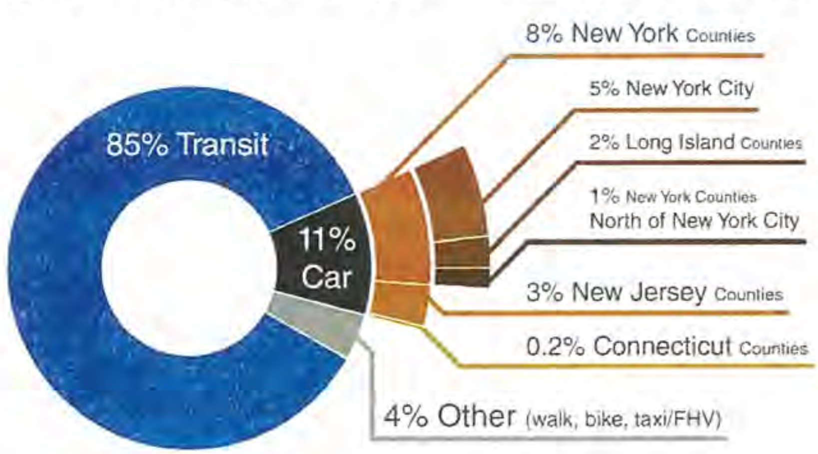
the Bronx (59 percent), and Brooklyn (56 percent), than in the region (28 percent). These households without access to a vehicle are part of the region's transit-dependent population. Vehicle access generally increases with income,[14] resulting in a greater number of all auto trips being made by those reporting a higher income than by households that reported a lower income.[15]

As shown in **Figure 5A-5** (on the following page), the percentage of households with no access to a vehicle generally decreases with distance from the Manhattan CBD. While some counties just outside New York City have vehicle access rates similar to those of New York City counties, these adjacent counties typically have a much lower share of commuters to the Manhattan CBD. For example, Hudson County in New Jersey has an auto ownership rate similar to that of Queens, but it contributes only 5 percent of the commuters to the Manhattan CBD, compared to 17 percent from Queens.

5A.3.5 Access to Employment in the Manhattan CBD

Chapter 1, "Introduction," describes the commuting behaviors of workers commuting to the Manhattan CBD, both by mode and by county of origin (**Figure 5A-4**). Given that the Project would directly affect the use of driving modes to access employment in the Manhattan CBD, this section provides more detail about existing travel mode choices for people who travel to employment in the Manhattan CBD. It also provides a more detailed discussion of the use of driving modes to commute to Manhattan from areas of New York City that do not have convenient transit access, since these areas may have fewer alternative to vehicle access for convenient travel to the Manhattan CBD.

Figure 5A-4. Work Trips Entering Manhattan CBD (by mode and origin)



Source: U.S. Census Bureau, CTPP, 2012-2016 Estimates.

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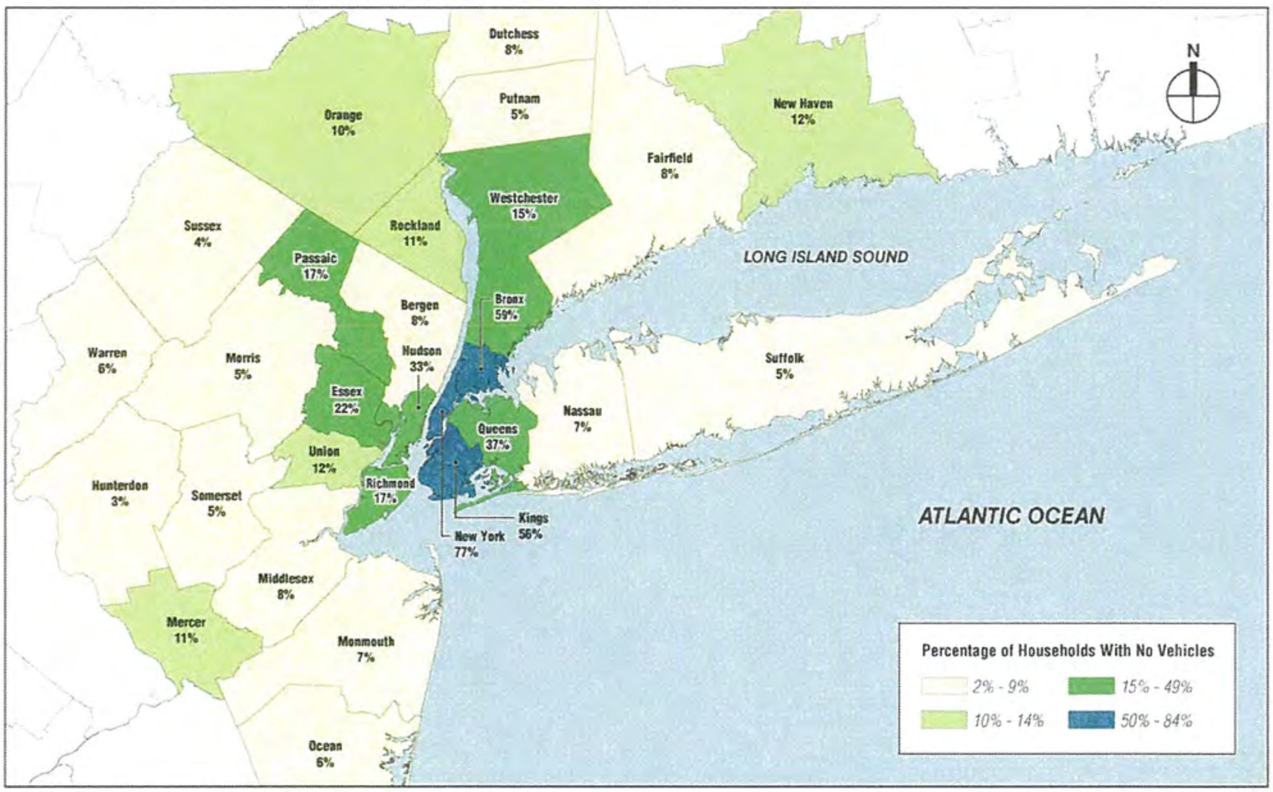
14 FHWA. Status of the Nation's Highways, Bridges, and Transit Conditions & Performance 23rd Edition. Chapter 3, "Travel." https://www.fhwa.dot.gov/policy/23cpr/chap3.cfm#access-to-vehicles.

15 Trip purpose categories included "Work," "School," Social/Recreational," "Shopping," and "Other"; more detailed options comprising "Other" included "Personal Business," "Home to Serving Passengers/Serving Passengers to Home," and "Other." New York Metropolitan Transportation Council and New Jersey Transportation Planning Authority. October 2014. 2010/2011 Regional Household Travel Survey. p. 124 (Table 4-19). www.nymtc.org/portals/0/pdf/RHTS/RHTS_FinalExecSummary10.6.2014.pdf.

Figure 5A-5. Households in the Regional Study Area with No Vehicle by County

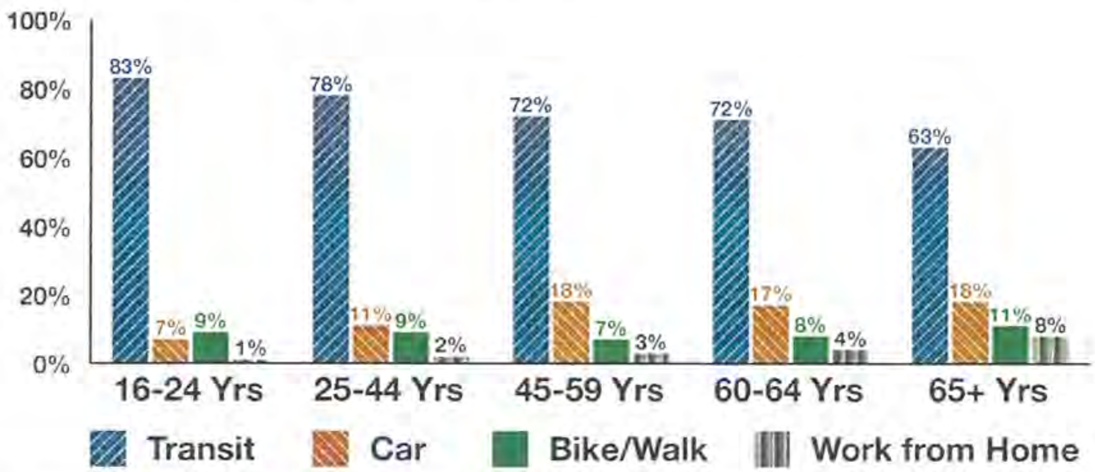


Source: U.S. Census Bureau. American Community Survey 5-Year Estimates, 2015–2019.

0 10 25 MILES

Figure 5A-6 provides data on the commute mode choice for travel to work in Manhattan by the age distribution of workers. The most detailed estimates available describe those working in Manhattan as a whole, but these data provide some insight into commute mode and worker age. As **Figure 5A-6** shows, the rate of driving or other auto modes to work is highest for ages 45 and over, with approximately 17 percent to 18 percent of workers commuting to Manhattan by auto. The use of public transportation to commute to work decreases with age, with the lowest rate (63 percent) for workers age 65 and older; even for this age group, the majority of workers use public transportation to commute to work in Manhattan.

Figure 5A-6. Travel Modes to Work (by age of workers)



Sources: Census Transportation Planning Package, American Community Survey 2012-2016

Residents of New York City in particular are most likely to use transit to travel to work in the Manhattan CBD (see **Chapter 1, "Introduction," Figure 1-6**). With a dense network of public transportation options throughout New York City and 24-hour service throughout that network, CTPP data indicate that 88 percent of the New York City residents who travel to work in the Manhattan CBD from outside the CBD use public transportation[16] for their commute. All of New York City is within one-half mile of a commuter rail station, subway station, or bus stop except one small area in southern Queens, a gated community called Breezy Point (see **Figure 5A-3**).

Most of New York City is also within one-half mile of the faster public transportation modes available—commuter rail, subway, express bus, or Select Bus Service (SBS), New York City's growing bus rapid transit system.[17] As shown in **Figure 5A-3**, few neighborhoods in New York City are more than one-half mile from these faster transportation modes. These areas are at the periphery of the city and along the waterfront (and, as noted, do have local bus service). In Manhattan, these areas include the far west side in the West 50s within the Manhattan CBD and on Roosevelt Island outside the Manhattan CBD. In Brooklyn, areas

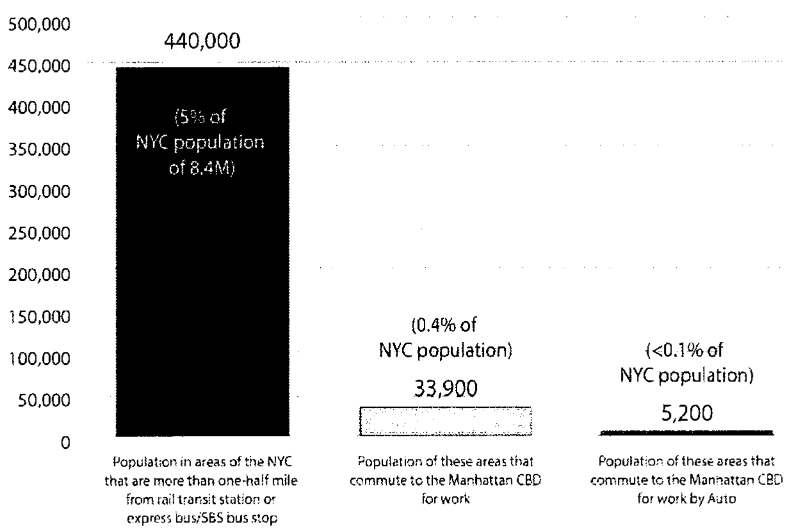
16 Unless otherwise noted, the terms "public transportation" and "transit" are used interchangeably throughout this chapter.

17 One-half mile represents an approximately 10- to 15-minute walk for an average pedestrian, and therefore indicates the availability of these transportation services.

include the neighborhoods of Red Hook, Borough Park, Rugby-Remsen Village, East New York, and Canarsie. In Queens, portions of the Astoria, College Point, South Ozone Park, Auburndale, Springfield Gardens, Breezy Point, Maspeth, and Ridgewood neighborhoods do not have access to faster public transportation via commuter rail, subway, or express bus/SBS service within one-half mile. In the Bronx, portions of the Soundview, Castle Hill, East Tremont, and Wakefield neighborhoods are more than one-half mile from commuter rail, subway, or express bus/SBS service. In Staten Island, these areas are around the shoreline and in central Staten Island. Some of the areas in New York City that are not close to transit are places from which no one commutes by car to the Manhattan CBD (see **Figure 5A-3**).

Approximately 440,000 people (or about 5.2 percent of the city's 8.4 million residents) live in these areas of New York City that are more than one-half mile from the faster public transportation modes of commuter rail, subway, or express bus/SBS service,[18] and approximately of them 33,900 commute to the Manhattan CBD (**Figure 5A-7**). Approximately 5,200 (15 percent) of these commuters to the Manhattan CBD travel by car.[19] These 5,200 car commuters come from locations distributed around the city with the largest concentrations in the Queens neighborhoods of Maspeth, College Point, Middle Village, and Springfield Gardens, the Soundview neighborhood of the Bronx, and Staten Island. Additional residents may be auto commuters who pass through the Manhattan CBD, but the total number of auto trips, even from areas with less convenient public transit access, is small even if these trips are included. **Chapter 17, "Environmental Justice,"** considers the potential effect of implementation of the CBD Tolling Alternative on low-income and minority populations who live in these areas.

Figure 5A-7. Population and Commuters to Manhattan CBD from Areas More than One-Half Mile from Commuter Rail, Subway, or Express Bus Service



Source: U.S. Census Bureau, CTPP, 2012–2016 Estimate.
Note: All areas of New York City other than Breezy Point, Queens, are within a half mile of local bus service.

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18 This population consists of people living within census tracts that are not within one-half mile of the faster public transportation services, when measured from the center of the census tract to the nearest transit stop.

19 2012–2016 CTPP.

Outside of New York City, the rest of the regional study area is also well-served by public transportation, including commuter rail, light rail, and public and private bus routes, and as noted previously, most people who work in the Manhattan CBD use public transportation to travel to and from work. In areas of the regional study area that are farther from New York City and less densely developed and populated, more areas are not within a convenient walking distance of public transportation. However, in those areas, households have a higher rate of access to a vehicle, and residents use or may use their vehicles to access public transportation (e.g., commuter rail stations).

5A.4 ENVIRONMENTAL CONSEQUENCES

5A.4.1 No Action Alternative

The No Action Alternative would not implement a vehicular tolling program with its associated tolling infrastructure and tolling system equipment. With the No Action Alternative, the study area's settlement patterns, transportation mobility (including chronic congestion in and around the Manhattan CBD) would remain similar to the existing affected environment. Overall demographic trends in terms of population and job growth would experience normal background growth. Community cohesion and access to employment for residents of the region would likely be similar to existing conditions.[20]

5A.4.2 CBD Tolling Alternative

This section describes the potential effects of implementation of the CBD Tolling Alternative on population characteristics and community cohesion, when compared with the No Action Alternative, beginning with a description of the potential benefits of the CBD Tolling Alternative and how they relate to social conditions. The section then evaluates the potential effects of the CBD Tolling Alternative on community cohesion and community facilities and services, its potential benefits or adverse effects to certain vulnerable social groups, including elderly populations, persons with disabilities, transit-dependent populations, and nondriver populations; and its effects on access to employment at the regional level.

5A.4.2.1 POTENTIAL BENEFITS TO SOCIAL CONDITIONS

With implementation of the CBD Tolling Alternative, transportation users in the region would benefit through travel-time savings, improved travel-time reliability, reduced vehicle operating costs, improved safety, and reduced air pollutant emissions. These changes would positively affect community connections and access to employment, education, healthcare, and recreation for residents. The CBD Tolling Alternative would result in the following social benefits:

- **Travel-Time Savings:** People in the region making trips to or within the Manhattan CBD by auto, FHV/taxi, bus, paratransit, or truck would benefit from travel-time savings improvements relative to the No Action Alternative due to decreased congestion within the Manhattan CBD. Part of these travel-time savings benefits would be offset by the increased transportation cost for those trips under the CBD Tolling Alternative in the form of a toll. People traveling by vehicle in the Manhattan CBD would

[20] Existing conditions described in this chapter are for conditions prior to the onset of the COVID-19 pandemic and therefore do not reflect changes to social conditions that may emerge as the pandemic subsides. At this time, it would be speculative to describe long-term (post-pandemic) changes to social conditions.

also benefit from travel-time savings due to decreased congestion in the Manhattan CBD and on other roadways. These benefits would occur in all tolling scenarios, with a reduction in vehicles crossing into the Manhattan CBD each day ranging from 15.4 percent to 19.9 percent and a reduction in daily VMT in the Manhattan CBD of 7.1 percent to 9.2 percent (see **Table 4A-5** and **Table 4A-7** in **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling"**). Tolling Scenario E would result in the greatest benefit, with 19.9 percent fewer vehicles entering the Manhattan CBD each day and a reduction of 9.2 percent in VMT relative to the No Action Alternative.

- **Reliability Benefits:** People traveling by auto, taxi/FHV, bus, paratransit, or truck to or within the Manhattan CBD would benefit from improved travel-time reliability due to the reduced congestion. Improvements to transportation system capacity or reliability can have social benefits such as greater ease of making and maintaining social ties and higher quality of life. Reliability of travel time refers to the level of travel time uncertainty. When travel times are unpredictable, travelers typically allow more time for their trip to account for possible delays. By reducing congestion in the Manhattan CBD, the CBD Tolling Alternative would reduce the current uncertainty associated with travel in the Manhattan CBD and allow travelers to reduce the buffer time set aside for their trip. Benefits would accrue not only to automobile passengers but also to bus passengers who would be able to rely on evenly spaced buses with reliable schedules. These benefits would also apply to school bus passengers and users of paratransit services.
- **Safety Benefits:** In all tolling scenarios, the CBD Tolling Alternative would result in fewer vehicles accessing the Manhattan CBD, which would help to reduce conflicts between vehicles and between vehicles and pedestrians and bicyclists, leading to an overall benefit to safety. The reduction in regional VMT because of the CBD Tolling Alternative could also lead to regional safety benefits. Some research indicates that VMT is directly related to the rate of fatal crashes;[21] therefore, the reduction in VMT could lead to a decrease in traffic fatalities in the region. Enhanced safety would benefit social conditions by improving community connectivity, reducing social isolation, and facilitating more physical activity and use of nonmotorized modes of transportation. While the increase in potential safety benefits may be offset to some degree by the propensity for drivers to drive at greater speeds in less congested conditions, experience with the London congestion-based pricing system suggests that the overall effect would be net positive; within the London zone, between 2000 and 2010 traffic collisions decreased by 40 percent per VMT.[22]
- **Accessibility Benefits:** Accessibility can be understood as the attractiveness of a place of origin (how easy it is to get from there to all other destinations) or of a destination (how easy it is to get to there from all other origins). Enhanced accessibility can benefit social conditions by improving community connections and access to employment, education, health care, and recreation. The CBD Tolling Alternative would improve accessibility for travelers throughout the region by decreasing roadway congestion. The CBD Tolling Alternative would also improve accessibility for disabled individuals

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21 Reid Ewing, Shima Hamidi and James Grace. 2016. "Urban Sprawl as a Risk Factor in Motor Vehicle Crashes," *Urban Studies*, Vol. 53/2, pp. 247 to 266. digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=https://www.google.ca/&httpsredir=1&article=1911&context=usgsstaffpub.

22 Davis, Alex. 2015. "London's Congestion Pricing Plan is Saving Lives." *Wired Magazine*. https://www.wired.com/2015/03/londons-congestion-pricing-plan-saving-lives/.

throughout the region by providing benefits to improve paratransit services, such as reduced roadway congestion and travel-time improvements as discussed above.

5A.4.2.2 COMMUNITY COHESION

This section evaluates potential effects to community cohesion resulting from the CBD Tolling Alternative. As noted previously in the discussion of the affected environment, community cohesion and civic life in the regional study area are typically local, organized around neighborhoods and communities, and in most cases are not focused on economic, social, and cultural ties to the Manhattan CBD. Therefore, this analysis focuses on the three primary ways the CBD Tolling Alternative could potentially affect community cohesion through travel pattern changes to and from the Manhattan CBD:

- **Installation of Tolling Infrastructure and Equipment:** The CBD Tolling Alternative would involve the installation of tolling infrastructure and tolling system equipment. This analysis considers whether this infrastructure and equipment would create a physical barrier that could separate or isolate communities.
- **Changes to Travel Patterns:** The CBD Tolling Alternative would change travel patterns and alter people's choices of how to travel into and out of the Manhattan CBD and would encourage more people to use transit to access the Manhattan CBD. The concern with respect to changing travel patterns and greater use of transit services is whether these changes would weaken community cohesion either by making it more difficult for people to physically connect with others throughout the region or by overburdening transit infrastructure that communities rely on for social ties.
- **Potential for Residential Displacement**: The CBD Tolling Alternative would not require any property acquisition or direct displacement of residences. This analysis evaluates whether implementation of the CBD Tolling Alternative would have the potential to result in indirect displacement of residents.

The following subsections address each of these concerns with respect to community cohesion. In addition, **Chapter 17, "Environmental Justice,"** considers these effects on low-income and minority populations.

Installation of Tolling Infrastructure and Equipment

The CBD Tolling Alternative would place tolling infrastructure and tolling system equipment within or adjacent to existing transportation rights-of-way, including sidewalks, and, in very limited instances, public parkland. As discussed in **Chapter 2, "Project Alternatives," Section 2.4.2.2**, the tolling infrastructure would include poles and mast arms, similar to those used for streetlights and traffic lights today; tolling system equipment including reader and meter cabinets and cameras; and signage similar in size and character to signs already present throughout Manhattan. **Chapter 2, "Project Alternatives," Figure 2-3** illustrates the proposed infrastructure; in addition, figures in **Chapter 9, "Visual Resources,"** provide before and after views of selected locations where new tolling infrastructure and tolling system equipment is proposed. The signage would be similar in size and nature to existing signs already in place. Therefore, this tolling infrastructure, tolling system equipment, and signage would not create a physical barrier that could separate or isolate communities, and therefore would not result in adverse effects to community cohesion.

Changes to Travel Patterns

The new toll for vehicles entering or remaining in the Manhattan CBD with the CBD Tolling Alternative would change travel patterns and alter people's choices of how to travel into and out of the Manhattan CBD. This section summarizes the changes in daily trips under the No Action Alternative and with the CBD Tolling Alternative. The transportation modeling conducted for the Project using the Best Practice Model (BPM) provides information on the projected changes in travel patterns between the No Action Alternative and the CBD Tolling Alternative (**Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling"**). The BPM results include changes in daily journeys, which are the round-trips from origin to destination and back to origin again.[23] The BPM is a regional transportation model used to predict changes in mode and route that would result from modifications to the transportation system, using adopted regional population, labor force, and employment forecasts. The model does not (and cannot) predict changes to the numbers of residents, workers, or jobs in the region but rather assumes that those numbers remain constant.

The section presents the change in total daily journeys to the Manhattan CBD and the change in non-work-related journeys (e.g., daily round trips with any combination or linked trips excluding the journey to work such as school, shopping, medical care, or entertainment purposes) to the Manhattan CBD. The different tolling scenarios would have varying effects on different areas (e.g., New Jersey vs. Long Island), and the particular tolling scenario that would result in the greatest change in trips varies depending on the area. This section presents data on travel patterns for each tolling scenario for each subarea of the regional study area.[24] The travel pattern data presented in this section include all modes of transport, including auto modes, public transportation modes, and walking and biking.[25]

Changes to Total Daily Journeys to the Manhattan CBD by All Modes

Overall, the model results show that all tolling scenarios would result in changes to the distribution of total daily journeys to the Manhattan CBD compared to the No Action Alternative, with an increase in total daily journeys from New Jersey and Long Island and a decrease in total daily journeys from portions of New York north of New York City, and Upper Manhattan, the Bronx, Queens, and Brooklyn. **Table 5A-2** and **Table 5A-3** present data on projected total daily journeys to the Manhattan CBD for each tolling scenario. The largest decrease in travel via all modes (i.e., including auto, public transportation, and walk/bike modes) into the Manhattan CBD would be approximately 3 percent for areas of Manhattan outside the Manhattan CBD under Tolling Scenario D. Daily journeys between New Jersey counties and the Manhattan CBD would increase by 1.9 percent to 3.5 percent and daily journeys between Long Island and the Manhattan CBD would increase by 2.5 percent to 3.7 percent, depending on the tolling scenario. In New York City, daily journeys to and from the Manhattan CBD would decrease in the Bronx, Brooklyn, other areas of Manhattan, and Queens, but would increase in Staten Island. The rest of Manhattan would have the largest percentage

23 More specifically, as described in **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling,"** a journey is defined as round-trip travel between principal and anchor locations such as home, work, school, retail, and entertainment.

24 Subareas include each New York City county (boroughs), outside the Manhattan CBD, inside the Manhattan CBD, Long Island counties, New York counties north of New York City, New Jersey counties, and Connecticut counties.

25 Modes of transport in the BPM consist of the following: drive alone, high-occupancy vehicle/shared ride, taxi/FHV, commuter rail, other transit (e.g., subway, bus), walk and bike, and school bus.

decrease in daily travel into the Manhattan CBD, with a decrease of approximately 1.5 percent to 2.8 percent, depending on the tolling scenario. Staten Island would experience an increase of approximately 3.8 percent to 7.2 percent in daily journeys to the Manhattan CBD, depending on the tolling scenario, with the absolute number compared to the No Action Alternative of approximately 1,600 to 3,000 new journeys.

Changes to Daily Non-Work-Related Journeys to the Manhattan CBD by All Modes

Table 5A-4 and **Table 5A-5** show the projected change in daily non-work-related travel into the Manhattan CBD by county of origin for all tolling scenarios (by all modes of transport [i.e., auto modes, public transportation modes, and walking/biking]). For non-work-related journeys, the BPM assumes that the total number of these discretionary trips remains steady regionwide, but the destination of non-work-related travel (e.g., for school, shopping, medical care, or entertainment or a combination of such trips) could change because of a change to the transportation network. For all tolling scenarios, the total number of these journeys would remain essentially the same between tolling scenarios (the small differences are due to rounding in the model results), but the destinations of the non-work-related journeys would vary. The largest percentage decreases in non-work-related journeys into the Manhattan CBD would be from New York counties north of New York City, with a decrease of 12 percent under Tolling Scenario E, a decrease of approximately 900 daily journeys. Brooklyn, Queens, and the Bronx would experience smaller percentage decreases of 2.9 percent (Tolling Scenario D), 2.8 percent (Tolling Scenario D), and 4.4 percent (Tolling Scenario E), respectively. Brooklyn and Queens would experience decreases of approximately 2,300 and 1,800 journeys, respectively. Non-work-related journeys to the Manhattan CBD from areas of Manhattan north of 60th Street would also decrease, with the greatest decrease (3,800 daily journeys) under Tolling Scenario D (decrease of 4.3 percent). The BPM projects an increase in non-work-related journeys from New Jersey counties, Long Island, Connecticut counties, and Staten Island to the Manhattan CBD. **Table 5A-5** also shows marginal increases in non-work Manhattan CBD journeys originating within the Manhattan CBD, likely due to reductions in congestion, which would encourage additional non-work journeys within the Manhattan CBD. Overall, in all tolling scenarios, the decrease in non-work-related journeys to the Manhattan CBD would be from origins distributed throughout the 28-county study area, from many different communities throughout the region.

Potential Community Cohesion Effects

The model results indicate that with the CBD Tolling Alternative some areas would have more trips to the Manhattan CBD and some areas would have fewer, as compared to the No Action Alternative. As noted above, the concern with respect to changing travel patterns is whether they would weaken community cohesion by making it more difficult for people to physically connect with others in their community.

Table 5A-2. Total Daily Journeys to/from the Manhattan CBD by Tolling Scenario (2023, All Modes)

ORIGIN GEOGRAPHIC AREA	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
New York City	2,139,533	2,131,066	2,131,928	2,130,513	2,125,391	2,125,464	2,127,367	2,128,633
Bronx	155,745	153,637	154,033	153,142	152,314	152,183	153,269	152,802
Kings (Brooklyn)	406,340	404,134	405,087	403,773	402,173	402,084	404,271	403,533
New York (Manhattan)	1,176,953	1,173,182	1,172,443	1,173,240	1,172,230	1,172,844	1,170,525	1,172,714
Inside Manhattan CBD[1]	879,667	880,292	879,506	882,033	883,365	883,222	880,713	881,592
Outside Manhattan CBD	297,286	292,890	292,937	291,207	288,865	289,622	289,812	291,122
Queens	358,122	355,812	356,002	354,938	354,368	354,350	354,576	355,266
Richmond (Staten Island)	42,373	44,301	44,363	45,420	44,306	44,003	44,726	44,318
Long Island Counties[2]	160,446	165,458	166,094	164,980	164,610	165,643	164,487	166,421
New York Counties North of New York City[3]	113,457	111,112	111,518	111,855	110,885	110,632	111,111	111,318
New Jersey Counties[4]	329,943	336,247	336,616	338,878	340,413	341,579	341,330	338,753
Connecticut Counties[5]	59,997	59,798	60,153	60,297	60,191	59,398	60,505	59,392
TOTAL	2,803,376	2,803,681	2,806,309	2,806,523	2,801,490	2,802,716	2,804,800	2,804,517

Source: BPM, WSP 2021.

1 Journeys originating in the Manhattan CBD are internal journeys within the Manhattan CBD.
2 Long Island counties include Nassau and Suffolk.
3 New York counties north of New York City include Dutchess, Orange, Putnam, Rockland, and Westchester.
4 New Jersey counties include Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, and Warren.
5 Connecticut counties include Fairfield and New Haven.

Table 5A-3. Change in Total Daily Journeys to/from the Manhattan CBD Compared to No Action Alternative (2023, All Modes)

ORIGIN GEOGRAPHIC AREA	SCENARIO A		SCENARIO B		SCENARIO C		SCENARIO D		SCENARIO E		SCENARIO F		SCENARIO G	
	No.		No.		No.		No.		No.		No.		No.	
New York City	-8,467	-0.4	-7,605	-0.4	-9,020	-0.4	-14,142	-0.7	-14,069	-0.7	-12,166	-0.6	-10,900	-0.5
Bronx	-2,108	-1.4%	-1,712	-1.1%	-2,603	-1.7%	-3,431	-2.2%	-3,562	-2.3%	-2,476	-1.6%	-2,943	-1.9%
Kings (Brooklyn)	-2,206	-0.5%	-1,253	-0.3%	-2,567	-0.6%	-4,167	-1.0%	-4,256	-1.0%	-2,069	-0.5%	-2,807	-0.7%
New York (Manhattan)	-3,771	-0.3%	-4,510	-0.4%	-3,713	-0.3%	-4,723	-0.4%	-4,109	-0.3%	-6,428	-0.5%	-4,239	-0.4%
Inside Manhattan CBD[1]	625	0.1%	-161	0.0%	2,366	0.3%	3,698	0.4%	3,555	0.4%	1,046	0.1%	1,925	0.2%
Outside Manhattan CBD	-4,396	-1.5%	-4,349	-1.5%	-6,079	-2.0%	-8,421	-2.8%	-7,664	-2.6%	-7,474	-2.5%	-6,164	-2.1%
Queens	-2,310	-0.6%	-2,120	-0.6%	-3,184	-0.9%	-3,754	-1.0%	-3,772	-1.1%	-3,546	-1.0%	-2,856	-0.8%
Richmond (Staten Island)	1,928	4.6%	1,990	4.7%	3,047	7.2%	1,933	4.6%	1,630	3.8%	2,353	5.6%	1,945	4.6%
Long Island Counties[2]	5,012	3.1	5,648	3.5	4,534	2.8	4,164	2.6	5,197	3.2	4,041	2.5	5,975	3.7
New York Counties North of New York City[3]	-2,345	-2.1	-1,939	-1.7	-1,602	-1.4	-2,572	-2.3	-2,825	-2.5	-2,346	-2.1	-2,139	-1.9
New Jersey Counties[4]	6,304	1.9	6,673	2.0	8,935	2.7	10,470	3.2	11,636	3.5	11,387	3.5	8,810	2.7
Connecticut Counties[5]	-199	-0.3	156	0.3	300	0.5	194	0.3	-599	-1.0	508	0.8	-605	-1.0
TOTAL	305	0.0	2,933	0.1	3,147	0.1	-1,886	-0.1	-660	0.0	1,424	0.1	1,141	0.0

Source: BPM, WSP 2021.

1 Journeys originating in the Manhattan CBD are internal journeys within the Manhattan CBD.

2 Long Island counties include Nassau and Suffolk.

3 New York counties north of New York City include Dutchess, Orange, Putnam, Rockland, and Westchester.

4 New Jersey counties include Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, and Warren.

5 Connecticut counties include Fairfield and New Haven.

Table 5A-4. Daily Non-Work-Related Journeys into the Manhattan CBD by County of Origin (2023, All Modes)

ORIGIN GEOGRAPHIC AREA	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
New York City	796,263	793,158	795,050	793,230	790,236	790,916	793,468	792,147
Bronx	41,511	40,239	40,971	40,352	39,707	39,691	40,314	40,401
Kings (Brooklyn)	80,405	79,193	79,998	79,218	78,082	78,373	79,390	78,643
New York (Manhattan)	601,900	601,749	601,362	600,892	600,864	601,196	601,131	601,306
Inside Manhattan CBD[1]	513,511	515,465	514,613	514,979	516,264	516,425	515,506	515,380
Outside Manhattan CBD	88,389	86,284	86,749	85,913	84,600	84,771	85,625	85,926
Queens	61,828	60,638	61,236	60,645	60,069	60,423	61,129	60,413
Richmond (Staten Island)	10,619	11,339	11,483	12,123	11,514	11,233	11,504	11,384
Long Island Counties[2]	16,566	17,188	17,314	16,675	16,568	16,789	16,724	17,382
New York Counties North of New York City[3]	7,640	7,162	7,182	7,190	6,752	6,749	6,962	7,066
New Jersey Counties[4]	46,807	48,993	49,582	50,187	49,701	49,956	50,305	50,063
Connecticut Counties[5]	1,514	1,486	1,786	1,872	1,807	1,720	1,901	1,764
TOTAL	868,790	867,987	870,914	869,154	865,064	866,130	869,360	868,422

Source: BPM, WSP 2021.

1 Journeys originating in the Manhattan CBD are internal journeys within the Manhattan CBD.

2 Long Island counties include Nassau and Suffolk.

3 New York counties north of New York City include Dutchess, Orange, Putnam, Rockland, and Westchester.

4 New Jersey counties include Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, and Warren.

5 Connecticut counties include Fairfield and New Haven.

Table 5A-5. Change in Daily Non-Work-Related Journeys into the Manhattan CBD Compared to No Action Alternative (2023, All Modes)

ORIGIN GEOGRAPHIC AREA	SCENARIO A		SCENARIO B		SCENARIO C		SCENARIO D		SCENARIO E		SCENARIO F		SCENARIO G	
	No.		No.		No.		No.		No.		No.		No.	
New York City	-3,105	-0.4	-1,213	-0.2	-3,033	-0.4	-6,027	-0.8	-5,347	-0.7	-2,795	-0.4	-4,116	-0.5
Bronx	-1,272	-3.1%	-540	-1.3%	-1,159	-2.8%	-1,804	-4.3%	-1,820	-4.4%	-1,197	-2.9%	-1,110	-2.7%
Kings (Brooklyn)	-1,212	-1.5%	-407	-0.5%	-1,187	-1.5%	-2,323	-2.9%	-2,032	-2.5%	-1,015	-1.3%	-1,762	-2.2%
New York (Manhattan)	-151	0.0%	-538	-0.1%	-1,008	-0.2%	-1,036	-0.2%	-704	-0.1%	-769	-0.1%	-594	-0.1%
Inside Manhattan CBD[1]	1,954	0.4%	1,102	0.2%	1,468	0.3%	2,753	0.5%	2,914	0.6%	1,995	0.4%	1,869	0.4%
Outside Manhattan CBD	-2,105	-2.4%	-1,640	-1.9%	-2,476	-2.8%	-3,789	-4.3%	-3,618	-4.1%	-2,764	-3.1%	-2,463	-2.8%
Queens	-1,190	-1.9%	-592	-1.0%	-1,183	-1.9%	-1,759	-2.8%	-1,405	-2.3%	-699	-1.1%	-1,415	-2.3%
Richmond (Staten Island)	720	6.8%	864	8.1%	1,504	14.2%	895	8.4%	614	5.8%	885	8.3%	765	7.2%
Long Island Counties[2]	622	3.8	748	4.5	109	0.7	2	0.0	223	1.3	158	1.0	816	4.9
New York Counties North of New York City[3]	-478	-6.3	-458	-6.0	-450	-5.9	-888	-11.6	-891	-11.7	-678	-8.9	-574	-7.5
New Jersey Counties[4]	2,186	4.7	2,775	5.9	3,380	7.2	2,894	6.2	3,149	6.7	3,498	7.5	3,256	7.0
Connecticut Counties[5]	-28	-1.8	272	18.0	358	23.6	293	19.4	206	13.6	387	25.6	250	16.5
TOTAL	-803	-0.1	2,124	0.2	364	0.0	-3,726	-0.4	-2,660	-0.3	570	0.1	-368	0.0

Source: BPM, WSP 2021.

1 Journeys originating in the Manhattan CBD are internal journeys within the Manhattan CBD.

2 Long Island counties include Nassau and Suffolk.

3 New York counties north of New York City include Dutchess, Orange, Putnam, Rockland, and Westchester.

4 New Jersey counties include Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, and Warren.

5 Connecticut counties include Fairfield and New Haven.

The journeys presented in the BPM results are for travel undertaken between two geographic areas for a particular reason—work, school, shopping, medical care, entertainment, etc. These are activities that indicate social and community ties between two areas. An increase in total daily journeys and daily non-work-related journeys to the Manhattan CBD suggests that a geographic area would potentially have more social ties and stronger community connections to the Manhattan CBD with the CBD Tolling Alternative as compared to the No Action Alternative. As described in the previous subsection, areas that would see increases in daily trips to the Manhattan CBD include New Jersey, Long Island, and Staten Island. The model results also show marginal increases in nonwork-related Manhattan CBD journeys originating within the Manhattan CBD, indicating additional journeys and connections for Manhattan CBD residents likely due to the reduction in congestion in the Manhattan CBD.

A decrease in total daily journeys and daily non-work-related journeys to the Manhattan CBD suggests that a geographic area could have fewer social ties and weaker community connections to the Manhattan CBD with the CBD Tolling Alternative as compared to the No Action Alternative. However, as described earlier, the decreases in total daily journeys and daily non-work-related journeys would be small—in general, decreases of about 4 percent or less depending on the origin geographic area and the tolling scenario. Where decreases of more than 4 percent would occur (e.g., the decrease in daily non-work-related journeys from New York counties north of New York City), the number of forgone journeys would be very small (approximately 900 journeys under Tolling Scenario E), compared to overall number of daily non-work-related journeys to the Manhattan CBD. Moreover, as noted earlier, the decrease in non-work-related journeys to the Manhattan CBD would be from origins distributed throughout the 28-county study area, from many different communities throughout the region. The decrease in total daily journeys and daily non-work-related journeys to the Manhattan CBD and their distribution throughout the region, rather than from particular locations or communities, indicates that most regional social ties and community connections to the Manhattan CBD would be maintained with the CBD Tolling Alternative.

For New York City, the model results predict decreases in total daily journeys and non-work-related journeys to the Manhattan CBD from Brooklyn, Queens, the Bronx, and areas of Manhattan north of 60th Street. In these areas, many different communities, including the physical neighborhoods and other cultural, religious, artistic, or activity-based communities, are closely tied to the Manhattan CBD. The decrease in non-work-related journeys to the Manhattan CBD from areas of Manhattan north of 60th Street, Brooklyn, Queens, and the Bronx, indicate that the CBD Tolling Alternative would discourage some travel into the Manhattan CBD by making driving there more expensive. As previously described, the forgone journeys to the Manhattan CBD from other areas of New York City would be a very small portion of the total daily journeys and non-work-related journeys to the Manhattan CBD from those areas, indicating that community cohesion and connection to the Manhattan CBD would be maintained. As noted earlier in the discussion of the affected environment, most people use transit to make their trips to the Manhattan CBD, and these trips would not be affected by the CBD Tolling Alternative.

All areas of New York City outside the Manhattan CBD have transit access to the Manhattan CBD and would not be isolated from community services or ties within the Manhattan CBD (see **Figure 5A-3**). For example, Manhattan's Chinatown neighborhood is an important destination for New York City's Chinese American

community, as are other specific neighborhoods throughout New York City and the region, such as those in Flushing, Queens; and Sunset Park, Bensonhurst, and Sheepshead Bay, Brooklyn. Access to Manhattan's Chinatown may be important for community cohesion among residents of these neighborhoods, and these areas would continue to have transit access to the Manhattan CBD with the CBD Tolling Alternative. Within Manhattan, neighborhoods are highly walkable or accessible via transit across 60th Street into the Manhattan CBD for most people. (For a discussion of effects on vulnerable social groups, including elderly populations, persons with disabilities, and transit-dependent populations, see **Subsection 5A.4.2.4, "Effects on Vulnerable Social Groups,"** later in this subchapter.)

As described in **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling,"** the CBD Tolling Alternative would result in a mode shift to transit across the region, with some of the decline in auto access to the Manhattan CBD translating to increases in transit trips (e.g., commuter rail, subway, bus, tram, and ferry). As discussed in **Subchapter 4C, "Transportation: Transit,"** the CBD Tolling Alternative would not result in adverse effects to the line-haul capacity of transit services serving the Manhattan CBD. None of the passenger increases on rail and subway transit routes or buses entering the Manhattan CBD, or on the Staten Island Ferry, would result in adverse effects related to line-haul capacity.[26] For subway routes, passenger increases would be below the impact threshold increment of 5 or more new passengers per car during the AM peak hour. There would be increased ridership on bus routes that would be accommodated by existing service levels. The CBD Tolling Alternative would also result in an increase in the number of passengers using transit stations in the regional transit system. As discussed in **Subchapter 4C, "Transportation: Transit,"** with improvements, the CBD Tolling Alternative would not result in unmitigated adverse effects on transit stations. Consequently, overall, potential transit ridership increases resulting from the CBD Tolling Alternative would not adversely affect community cohesion by overburdening transit infrastructure.

Notwithstanding the transit accessibility between the Manhattan CBD, New York City, and the regional study area, there would be an additional cost with the CBD Tolling Alternative for individuals who choose to drive, who do not have access to transit, or who must rely on driving to get to the Manhattan CBD. As noted in **Chapter 17, "Environmental Justice,"** and **Chapter 18, "Agency Coordination and Public Participation,"** during early public outreach for the Project in fall 2021, members of the public raised concerns related to the increased cost of travel to the Manhattan CBD for low-income drivers, low- and middle-income families in the Manhattan CBD, and residents of the Manhattan CBD travelling regionally to visit family and friends outside the Manhattan CBD. The costs incurred by individuals driving to the Manhattan CBD would vary widely, depending on individual circumstances and the specific tolling scenario (see **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling," Section 4A.4.5**). The greatest cost would be incurred by those who make frequent driving journeys to the Manhattan CBD during peak hours. Driving to and from the Manhattan CBD is already expensive given the very limited availability of free or low-cost parking and the cost of off-street parking or taxi/FHV fares, and it is likely that people who drive regularly have higher incomes.[27] Individuals who drive less frequently would incur lower costs

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26 Transit line-haul capacity is the capacity of a transit mode at its peak ridership point.

27 FHWA. *Status of the Nation's Highways, Bridges, and Transit. Conditions & Performance. 23rd Edition.* Chapter 3 Travel. Impact of Income Distribution on Travel. October 22, 2020. https://www.fhwa.dot.gov/policy/23cpr/index.cfm.

because of the toll. ***[See Chapter 17, "Environmental Justice," Section 17.7, for mitigation measures the Project Sponsors will implement to address increased costs for low-income drivers to the Manhattan CBD, including new measures added for the Final EA.]***

Potential for Residential Displacement

Another concern related to community cohesion is the potential for a project to affect population and housing characteristics of an area by causing direct or indirect residential displacement.

Direct residential displacement occurs when residents must move from their homes as a direct result of an action. As noted above, the tolling infrastructure and tolling system equipment associated with the CBD Tolling Alternative would be within or adjacent to existing transportation rights-of-way, including sidewalks, and, in very limited instances, public parkland, and would not involve the acquisition of private property or the displacement of any residential uses.

Indirect residential displacement occurs when a change in socioeconomic conditions resulting from a project leads to conditions that require residents to move, such as increased rents or other increases in the cost of living. As noted in **Chapter 17, "Environmental Justice,"** and **Chapter 18, "Agency Coordination and Public Participation,"** during early public outreach for the Project in fall 2021, members of the public voiced concerns about the potential for indirect displacement of low-income residents to occur as a result of the CBD Tolling Alternative.

Indirect residential displacement can occur when a project results in substantial new development that is markedly different from existing uses, development, and activities within a neighborhood, and thus alters one or more of the underlying forces that shape real estate market conditions in an area. The CBD Tolling Alternative would not result in substantial new development or uses that would be markedly different from existing uses and activities within neighborhoods. More importantly, as discussed in this subsection, the CBD Tolling Alternative would not alter socioeconomic conditions related to the following, and therefore would not be likely to result in indirect displacement:

- Potential for residents relocating to avoid the cost of the toll
- Potential for indirect displacement because of increased cost of living within the Manhattan CBD or elsewhere

<u>Potential for Residents Relocating to Avoid the Cost of the Toll</u>

The CBD Tolling Alternative would introduce a new cost for residents of the Manhattan CBD who travel by vehicle into and out of the Manhattan CBD. However, only a small percentage of journeys within and from the Manhattan CBD are by vehicle, and residents who travel by other modes would not pay the toll. As described earlier in this subchapter in the discussion of the affected environment, approximately 20 percent of the residents of the Manhattan CBD have access to a vehicle. Based on the BPM results, approximately 1.0 million total daily journeys would occur within or from the Manhattan CBD under any tolling scenario and in the No Action Alternative, and approximately 10 percent of these journeys would be by driving (either the drive alone, high-occupancy vehicle, or taxi/FHV modes). In addition, residents of the Manhattan CBD whose New York adjusted gross income for the taxable year is less than $60,000 would be

entitled to a New York State tax credit equal to the aggregate amount of Manhattan CBD tolls paid during the taxable year, as discussed in **Chapter 2, "Project Alternatives."** Overall, the additional cost of the toll is not expected to substantively affect population characteristics of the Manhattan CBD by inducing CBD residents to relocate to avoid the toll.

For other residents of the regional study area, the new toll with the CBD Tolling Alternative could lead them to relocate out of the region entirely to avoid extra commuting costs. However, this would be unlikely to result in indirect residential displacement. Many factors influence a household's decision about where to live, and each household seeking to avoid the toll would undertake its own decision-making process. Any changes in residential patterns would be broadly distributed throughout the regional study area because of the wide variety of factors that influence a household's decision about where to live, including housing costs, work location and commuting, income, proximity to family and friends, schools, and perceptions about safety and crime. Certain households, such as low-income households or those tied to protected housing units (i.e., housing units that are rent-stabilized, rent-controlled, public housing, Mitchell-Lama rental, or subject to other regulations), may not be able to afford to move. Households seeking to avoid the toll would undertake their own decision-making process balancing these and other factors and reflecting their own unique priorities and preferences, and they would reach different conclusions about whether to relocate and, if so, to where. It is unlikely that the toll would outweigh the other factors that influence a household's decision on where to live such that it would result in indirect residential displacement. Furthermore, areas near the Manhattan CBD, where residents have the most social and community ties to the Manhattan CBD and are most likely to travel regularly to the Manhattan CBD, have high levels of transit access to the Manhattan CBD. Residents of these areas would continue to be able to use transit to access the Manhattan CBD and avoid the toll. Therefore, the CBD Tolling Alternative would not substantively affect population characteristics of the regional study area by incentivizing residents to relocate to avoid the toll.

The new toll with the CBD Tolling Alternative would increase the cost of driving into the Manhattan CBD, which could make residential neighborhoods near transit—including the Manhattan CBD itself—more attractive for residents, because this could help residents avoid the toll. However, this is unlikely to affect real estate market values either within the Manhattan CBD or elsewhere. Similar to residents who might seek to relocate from the Manhattan CBD or regional study area, any changes in residential patterns related to residents moving closer to transit would be broadly distributed throughout the regional study area because of the wide variety of factors that influence a household's decision about where to live. Therefore, no particular area would be likely to see a large inflow or outflow of new residents seeking to avoid the toll, and the CBD Tolling Alternative would be unlikely to result in notable changes in real estate market conditions. Any relocation that may occur because of households seeking to avoid the toll would not have the potential to markedly change the demographic or community character of an area, and therefore would not adversely affect community cohesion.

<u>Potential for Indirect Displacement Because of Increased Cost of Living Within the Manhattan CBD or Elsewhere</u>

During early public outreach for the Project in fall 2021, some commenters raised concerns that the CBD Tolling Alternative would result in increased costs of living within the Manhattan CBD that would result in

indirect displacement of low-income residents. However, this is unlikely to occur, because the CBD Tolling Alternative would not result in changes in market conditions that would increase real estate values, so as to result in increased rents; the CBD Tolling Alternative would not result in an increase in the cost of goods within the Manhattan CBD; and low-income residents of the Manhattan CBD would be entitled to a tax credit to offset their tolls.

In terms of increased real estate values, as noted earlier, any changes in residential patterns related to residents moving closer to transit would be broadly distributed throughout the regional study area because of the wide variety of factors that influence a household's decision about where to live. In addition, in areas to which people might move to avoid the toll or be close to transit, the value of residential property and rents is already influenced by the existing proximity to transit. While there could be some additional value to living close to transit (i.e., the value of living near a commuter station) in the future with the CBD Tolling Alternative, there is value to such proximity under existing conditions. The CBD Tolling Alternative itself would not introduce a new residential amenity that could substantively alter rents. Within the Manhattan CBD in particular, residential property values are already well established and influenced by factors such as the area's central location in New York City and its proximity to transit. While some research indicates that a reduction in traffic congestion resulting from congestion pricing could increase residential sales prices and thus could exert upward pressure on rents,[28] the potential social, economic, and environmental benefits from the CBD Tolling Alternative—some of which are detailed in other subsections of this subchapter—would not be substantial enough to markedly influence rents or residential property market conditions given the other factors already influencing New York City's residential real estate market (i.e., its central location and proximity to transit, jobs, cultural amenities, etc.).

Moreover, the substantial number of apartments in the Manhattan CBD that have protected rents (e.g., apartments under the jurisdiction of the New York City Housing Authority and apartments that are protected by New York State's rent control and rent stabilization laws) would not be subject to market-driven prices increases.[29] Furthermore, the Manhattan CBD already has the highest cost of living and highest home prices and rents in the region, and it is unlikely that many individuals would seek to move to the Manhattan CBD specifically to avoid the toll or because of a reduction in congestion. Therefore, the CBD Tolling Alternative would not substantively affect population characteristics of the Manhattan CBD or other transit hubs by attracting new residents seeking to avoid the toll.

Furthermore, as discussed in **Chapter 6, "Economic Conditions,"** the cost of new tolls with the CBD Tolling Alternative would not be likely to result in an appreciable increase in the cost of goods within the Manhattan CBD. In addition, as noted earlier, residents whose primary residence is inside the Manhattan

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28 A study of conditions in London found that reductions in traffic in the congestion zone increased residential sales prices in the congestion zone. Tang, Cheng Keat. 2018. "Essays in the economics of transportation, housing and discrimination." PhD thesis, The London School of Economics and Political Science. etheses.lse.ac.uk/3797/.

29 Estimates of protected units in the Manhattan CBD are not available, but approximately 58 percent of the renter-occupied households in New York City reside in protected housing units (i.e., housing units that are rent stabilized, rent controlled, public housing, Mitchell-Lama rental, or subject to HUD or other regulation) with a substantial proportion of these units in Manhattan. Source: Waickman, C. R., Jerome, J. B. R., Place, R. *Sociodemographics of Rent Stabilized Tenants*. New York City Department of Housing Preservation and Development. 2018. www1.nyc.gov/assets/hpd/downloads/pdfs/services/rent-regulation-memo-1.pdf.